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VOL. II.—31ST YEAR.

SYDNEY, SATURDAY, AUGUST 26, 1944.

No. 9.

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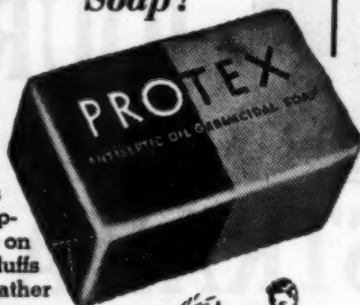
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### THE DEVELOPMENT OF THE SURGICAL TREATMENT OF CARCINOMA OF THE BREAST.

By C. CRAIG,

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AND

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It was recently decided to analyse a series of cases of carcinoma of the breast which had been treated in this hospital over a period of years. The history of the development of the modern treatment was entered into as a preliminary study. This historical study was so interesting that it was decided to arrange and present outstanding excerpts from the historical literature. The history has been divided into various phases. Each phase is usually associated with several well-known names. To avoid repetition, in some cases, excerpts are presented only from those writings which are most representative of each phase.

The history falls naturally into the following periods: phase I, the histological period (up to 1860); phase II, local removal of the tumour (up to 1867); phase III, removal of the breast and axillary glands (1867); phase IV, removal of the breast and axillary glands and the fascia covering the *pectoralis major* (1874 to 1894); phase V, removal of the breast and axillary glands and of the pectoral muscles (1894 to 1904); phase VI, removal of less skin and more fascia (1904 onwards). The dates are rough indications only.

#### Phase I: The Histological Period, up to 1860.

With the construction of the achromatic microscope in Paris, 1824, a new era opened in cancer research. The

great argument of the period was as to the origin of cancer cells. In spite of their careful histological studies, all the authoritative writers of this period, including Virchow, believed in the origin of cancer from a foreign blastema. Ewing<sup>(1)</sup> sums up the situation as it existed in 1860.

"While still burdened by the blastema theory of origin the study of cancer had succeeded up to 1860 in rather accurately describing and classifying the main classes of tumours chiefly according to microscopical structure. The description of the benign tumours, the existence of various types of carcinoma, the malignancy of epithelioma, and the separate position of sarcomas were generally accepted facts. Correct conceptions of the histogenesis, however, were impossible until Virchow founded the cellular pathology upon the doctrine of *omnis cellula e cellula*. There had been several opponents of the idea that cells could be formed from exuded lymph, notably Cruveilhier, while Renak at the same time with Virchow claimed that cells grew exclusively from other cells by endogenous reproduction; but Virchow applied the new principle rigidly to all departments and especially to the origin and growth of tumours. Coincidentally with this memorable service he fell into two grave errors. He failed to correctly interpret the deceptive evidence of endogenous cell formation and he was led to believe that cancer cells originated from connective tissue cells. The latter error he never fully relinquished, and possibly on this account his monumental work, "*Die krankhaften Geschwulste*", was never extended over the field of cancer.

"Although many authors opposed the theory of the connective origin of cancer, and Meckel in 1857 had traced the origin of a buccal tumour directly from the lining epithelium, it remained for Thiersch to present convincing evidence of the invariable derivation of epithelioma from lining epithelium.

"Waldeyer extended Thiersch's observations to the internal organs, and traced the origin of cancer of the stomach, liver and kidney to the epithelial cells of these organs. He first described the isolation of these cells by indurated connective tissue, and held that tumours



developed from these isolated cells. The formation of secondary tumours he demonstrated to be the result of continuous growth through blood and lymph vessels as well as of cell emboli."

It will be seen that the modern conception of the origin of cancer dates from Thiersch and Waldeyer. Unfortunately Thiersch's original article is not available. There now follows Waldeyer's original suggestion that carcinoma of the breast spreads by invasion of the lymphatics:<sup>(2)</sup>

"Quite often with carcinoma of the mamma extremely long, narrow fusiform and cylindrical cellular streaks of an epithelial nature are encountered which seem to lie in the fissures and interstices of the stroma and often grow side by side in large numbers.

"Frequently they seem to originate in pronounced carcinomatous nodules and can be traced far into the surrounding connective tissue without roundish carcinomatous bodies being encountered there at all. They differ just as much from the fusiform streaks of cells as they do from the compressed carcinomatous bodies; for decomposed and degenerated cells must be contained in the latter just as in compressed lactiferous ducts, which likewise could be thought of. However, the formations meant here always contain fresh, well-formed, epithelial cells. In my opinion this is a question of lymph cavities, the beginnings of lymph vessels in the mamma, into which the epithelial cancerous elements have strayed. I have even less doubt as to the accuracy of this theory since finding in many other places the same conditions even more distinctly, as I shall set out later. On several occasions with cases of mammary carcinoma passed on to me by Dr. Methner, I was able to dissect in the connective tissue of the M. pector. major larger, moniliform, whitish vessels which were filled throughout with carcinomatous masses (epithelial cells), a condition which has more than once been observed by others. Special attention must be paid to this condition of the lymph tracks, as it is highly probable that it is closely associated with the occurrence of the secondary cancerous eruptions."

#### Phase II: Local Removal of the Tumour, up to 1867.

The following description of the contemporary surgical treatment of carcinoma of the breast is taken from an article by Charles Moore published in 1867:<sup>(3)</sup>

"Taught without doubt by foregoing failures, our surgical ancestors adopted a method of operating which might well have been expected to prove effectual against a local recurrence of the disease. They transfixed the base of the mamma, and, raising it with ligatures, swept off the whole organ, together with all the skin that covered it. The proceeding had a barbarous appearance enough, but it was promising; and, if their knowledge of the disease had led the surgeons of the time to adopt it before the skin was hopelessly infiltrated, they must have met with more success than they appear to have done. Postponing, however, all operation until the skin was brawny and covered with tubercles, and the deeper textures were involved without limit, they failed too often, with even such extensive cutting as they adopted, to comprehend the entire disease.

"It was a mistaken kindness which led to a change of this mode of operating. Under the influence of a clergyman, who expressed what must have been a prevailing horror at such Amazon surgery, the practice was changed to an incision in the integument, which was reflected in flaps and brought together again after the removal of the cancerous tumour. There could have been no diminution of suffering by this prolongation of the operation, and what was gained by it in neatness was lost in life. With the remains of the breast, as well as in their own texture, the flaps enfolded fragments of diseased substance, and cancer soon reappeared. It was an operation proper to innocent tumours, which can be removed without the needless mutilation of extirpating the breast, but was quite inapplicable to cases of mammary cancer.

"In our own day various modes of operating are practised. Sometimes the tumour only is removed; sometimes that segment of the breast in which the tumour lies is taken away with it; sometimes, with the intention of

extirpating the entire mamma, the failure happens that a portion of it is unwittingly left behind; sometimes the breast is carefully removed, but the propensity of cancer to extension in the skin is misapprehended, and for symmetry's sake a flap, which even includes the nipple, is preserved; and yet again, there being no definite plan in the mind of the operator but that of cutting wide of the tumour, portions of the organ itself are left behind. The consequence of this last method of operating may be at once apparent when, on examining the mass thus dug out of the centre of the breast, hard cancerous cords, continuous with the principal tumour, are found to have been cut across. Their outer extremities, prolonged to the margin of the breast, remain behind, and it is fortunate if the discovery be made before the wound is closed and the patient replaced in bed."

#### Phase III: Removal of the Breast and the Axillary Glands, 1867.

In continuing the paper already quoted above, Charles Moore presented eleven cases showing the evil results of local removal. The following excerpt shows the conclusions to which he came:

"Though the foregoing cases may not illustrate all the phases of recurrent cancer of the breast, they appear to bear with a decisive uniformity on the questions respecting the nature of the disease. It is possible that there may be methods of recurrence which would favour other conclusions than those I am about to draw, but as my cases have not been selected to prove an opinion already formed, I am satisfied that they represent the usual occurrences. They are also in accordance with examples of cancer, which have been demonstrated to recur in the same manner in other organs. The following are the conclusions to which my cases lead.

"Local recurrence of cancer after operations is due to the continuous growth of fragments of the principal tumour.

"Such recurrence may take place also in a residual part of the organ, respecting which it cannot be asserted that it was cancerous at the time of the operation.

"Such recurrence may further happen in a structure adjoining a completely extirpated breast, and on a comparison of cases may be held to be produced by disseminated fragments of the original tumour.

"The recurrent cancer is subject as well as due to local conditions, and especially adapts itself to the distribution of the absorbents. Its continuity with the first tumour may be traceable over half the chest, the pleura, and the glands from the neck to the loin or the inguinal region, and possibly also to the liver.

"After the removal of a portion of the breast, the recurrent cancer does not involve the remainder of the organ indiscriminately, but commences in that part of it which immediately adjoins the scar.

"The progress of recurrent cancer after a partial removal of the breast is not exclusively organic, and does not even show a preference for that organ, but rather is centrifugal from the scar; and, when free in both directions, it tends toward the axilla earlier than to the residue of the breast.

"Cancer once established in either mamma, its primacy is thenceforth supreme. When one breast has been wholly or partially removed, recurrent cancer does not spring up as a new disease in the opposite breast, but on the same side as the original tumour. It may, nevertheless, be possible that, a mammary cancer having been wholly extirpated, cancer may reappear in another part of the body, which other part may be the remaining breast. I have not met with such a case.

"It is not sufficient to remove the tumour, or any portion only of the breast in which it is situated; mammary cancer requires the careful extirpation of the entire organ.

"The situation in which the operation is most likely to be incomplete is at the edge of the mamma next to the sternum.

"When any texture adjoining the breast is involved in or even approached by the disease, that texture should be removed with the breast. This observation relates



especially to skin, to lymphatics, to much fat, and to pectoral muscle. The attempt to save skin which is in any degree unsound is of all errors perhaps the most pernicious, and whenever its condition is doubtful, that texture should be freely removed. A broad scar and the stretching and compression due to its subsequent contraction appear to be especially satisfactory.

"In the performance of the operation it is desirable to avoid, not only cutting into the tumour, but also seeing it. No actually morbid texture should be exposed, lest the active microscopic elements in it be set free and lodge in the wound. Diseased axillary glands should be taken away by the same dissection as the breast itself, without dividing the intervening lymphatics; and the practice of first roughly excising the central mass of the breast, and afterwards removing successive portions which may be of doubtful soundness, should be abandoned. Only by deliberately reflecting the flaps from the whole mamma, and detaching it first at its edge, can the various undetected prolongations of the tumour and outlying nodules be included in the operation. To parts suspected of disease but not capable of removal it is desirable to apply the chloride of zinc. An edge of skin may be touched with the solid caustic; a paste of it may be laid on portions of the open wound; and, however healthy in appearance, the whole remaining surface may be washed with a solution of the chloride, of a strength proportionate to the delicacy or vitality of the textures and the thickness or thinness of the flaps, and varying from twenty to forty grains in the ounce of water. By these various applications the action of the zinc may be graduated to produce the strongest caustic effect or to merely whiten the superficial textures. Regard must be had to the depth of the subjacent structures in the use of the stronger preparations, especially on the wall of the chest; and in any strength the zinc should not be in contact for more than a moment with the large veins in the axilla, lest it should soak through their thin walls, and, producing phlebitis or a chemical action on the blood, should set up a traumatic pyæmia.

"The conclusions, briefly stated, are partly theoretical and partly practical. The former are:

"That the recurrence of cancer is due to local conditions.

"That these conditions are not regional, so as to belong to structures out of continuity with the first tumour.

"That neither are they organic, whether as indiscriminately involving the residue of a mamma operated upon, or so as to be transferable to the second breast in consequence of the removal of that first affected.

"That, on the contrary, recurrent cancer begins near the scar.

"That, when free in both directions, it tends toward the axilla earlier than to the residue of the breast.

"That, consequently, centrifugal dispersion, not organic origin, determines the recurrence of cancer.

"The practical conclusions are:

"That cancer of the breast requires the careful extirpation of the entire organ.

"That the situation in which this operation is most likely to be incomplete is at the edge of the mamma next to the sternum.

"That, besides the breast, unsound adjoining textures, especially skin, should be removed in the same mass with the principal disease."

Sampson Handley states that "Moore must be regarded as the father of modern breast surgery as applied to cancer".<sup>(1)</sup> Although, according to Sampson Handley, Charles Moore's teaching became an accepted tradition at the Middlesex Hospital, his views were not generally accepted in Great Britain. Here and there very free operations were practised. According to Watson Cheyne,<sup>(2)</sup> Lister was removing both pectoral fascia and glands towards the end of the sixties; but it was many years before removal of the whole breast and of the glands was accepted as standard practice. In 1887, for instance, when Sir Mitchell Banks read a paper before the Harveian Society advocating the removal of the glands in every case, only one speaker supported him. Sir Mitchell Banks deserves more than a word of praise for his efforts to

improve the breast operation. His style of writing is livelier than is usual in these days. The following is from an article published in 1882:<sup>(3)</sup>

"I happen to live in a district where cancer is common. Liverpool is in an area which the Registrar-General's statistics show to be clearly of a malignant habit. The reason of this I cannot say; but it is a fact, and possibly thus it is that my attention has been for some time drawn to the subject. In 1877, I published a little article in the *Liverpool and Manchester Medical and Surgical Reports*, based upon a paper read before a meeting of the Lancashire and Cheshire Branch of the Association. In it I asserted that surgeons did not remove cancers of the breast. Five years later, before the whole Association, I reassert the statement. Surgeons, as a rule, do not remove cancers of the breast. They persuade their patients that they do, and they almost persuade themselves; but there is always that little bit which they leave behind, and which, they fondly hope, will not grow, because it is such a little bit. Alas! that so little leaven should leaven the whole lump. If one turns to the surgery books of one hundred and fifty or two hundred years ago, the true method of removing a cancerous breast will be found. The breast was laid hold of with great pincers; and, having been cut clean off, the surface was rubbed over with a red-hot poker. Against a proceeding so shocking to the age, modern taste revolted; and so for many years surgeons have been removing a little elliptical bit of skin including the nipple, and have been carefully dissecting out the mamma. Then the remaining skin, all impregnated with cancer germs, has been carefully laid down again and neatly stitched together, so that everything should heal up quickly. Hence removal of a cancerous breast in this way came to be considered a safe proceeding. Very few people indeed died from the operation—very few indeed. Unfortunately, they all died at a little later period from want of a little more of it. Hence, looked at from another point of view, it was the most useless of all operations, inasmuch as it never effected a cure. My present contention, therefore, is for a return to the old plan of sweeping everything away, and leaving a great hole, if you like. The operation will no longer be the bit of surgical tailoring that it has been, and many more patients will die from it; but many more also will be spared to lead useful lives and escape the horrors of a return—tenfold worse than the original mischief."

#### Phase IV: Removal of the Breast, of the Axillary Glands and of the Pectoral Fascia, 1874 to 1894.

The concentration of attention on the pectoral fascia was a most important step forward, as it laid the foundations of the modern operation. Apparently the first surgeon to remove systematically the pectoral fascia and even at times the *pectoralis major* was Volkmann. In his *Beiträge zur Chirurgie* Volkmann<sup>(4)</sup> wrote as follows:

"I make it a rule never to do a partial amputation for cancer of the breast, but remove the entire breast even for the smallest tumours, and at the same time I take away a liberal piece of skin. The skin defect is, of course, very great when one operates in this manner, and the wound, in consequence, requires a long time for healing. Furthermore, in making the lower incision I cut right down to the pectoralis muscle and clean its fibres, as I would for a classroom dissection, carrying the knife parallel with the muscular fasciculi and penetrating into their interstices. The fascia of the muscle is, accordingly, entirely removed. I was led to adopt this procedure because, on microscopical examination, I repeatedly found when I had not expected it that the fascia was already carcinomatous, whereas the muscle was certainly not involved. In such cases a thick layer of apparently healthy fat separated the carcinoma from the pectoral muscle, and yet the cancerous growth, in places demonstrable only with the microscope, had shot its roots along the fibrous septa down between the fat lobules and had reached and spread itself out in flat islands in the fascia. It seems to me, therefore, that the fascia serves for a time as a barrier, and is able to bring to a halt the spreading growth of the carcinoma."

Volkman's work had a great influence on Halsted, who was later to do so much to advocate a freer operation. The above extract is quoted by Halsted<sup>(4)</sup> as one which influenced him greatly. In further discussion on Volkman's work he writes:

"Many years ago, Volkman offered an explanation for the fact that the carcinoma may lie in masses on the muscle and be adherent to its fascia and still not involve the muscle itself. He believed that the lymphatic vessels spread themselves out in the fascia covering the *pectoralis major* muscle and do not follow the blood vessels into the connective tissue septa between the muscle bundles; that there is not, as a rule, a free communication between the lymphatic system of the muscle and that of the fascia covering it. Haidenhain's observations support this theory of Volkman's, and it is further strengthened, as Haidenhain says, by the physiological investigations of Ludwig and Schweigger-Seidel on the lymphatic vessels of fascia and tendon. These investigators have established the fact that there is an intricate network of lymphatic vessels on the surface of muscle and on the upper side of all fascias. The direction of the lymphatic current is from the muscle to the fascia, and not in the reverse direction. Injections pass readily in the former, but are impossible in the latter direction."

The series of operations performed by Volkman and quoted by Halsted was performed between 1874 and 1878.

Another German writer, who had great influence on Halsted, and indeed on all workers in the field of carcinoma of the breast, was Haidenhain. Haidenhain's work indeed is of the first importance in the history of cancer. The following extracts show that his discoveries and suggestions form the basis of modern work on cancer:<sup>(5)</sup>

"I am firmly convinced from what I have seen that carcinomata, when they have actually made their way into the lymphatic channels, and such is usually the case, have invariably sent their outposts (*Vorposten*) at once to the surface of the muscle, no matter what the thickness of the layer of fat between breast and muscle may have been; in other words, that a tumour, however freely movable on the underlying parts, has almost certainly advanced as far as the surface of the muscle.

"From the impression which I gained, the epithelial cells spread in the retromammary adipose tissue essentially by continual proliferation by way of the lymph tracks, which they eventually perforate. That at the same time occasionally embolic implantation of single or some loosened cancer cells also takes place through the lymph current is to be assumed as probable, and, although it is rare on the whole, still you do find pictures which appear to support this theory, in particular those of epithelial cells lying loose and movable in the lumen of a lymphatic vessel, possibly even intermingled with single leucocytes."

"... I consider it impossible to really completely remove the *fascia pectoralis* usually sewn through with cancer germs, without also removing the entire surface of the mammary muscle."

"... After careful examinations of my specimens I reached the firm conviction that every mamma affected with cancer is altered entirely. In such a breast, even where the cancer nodule is small, only here and there do you find a spot which appears quite normal. Everywhere, even far away from the main focus of the disease, you find the epithelium proliferating in the acini, the lumen of the glandular vesicles often disappeared, the acini themselves enlarged, a quite striking nuclear increase in the periacinous connective tissue, the acini no longer sharply defined against the surrounding connective tissue by the *tunica propria*, as is normal, but often the tunica is perforated by the epithelium or has even disappeared entirely, in later stages a mutual proliferation and mixing of epithelial and connective tissue cells so that, particularly with weaker enlargements, nothing more of the former clearly drawn construction of the glandular lobules can be recognised, while with stronger enlargements it is possible here and there to still recognise the original structure."

As far as Great Britain was concerned, the most outstanding influence in the direction of a freer operation was that of Stiles. Stiles used a method of immersing the cancerous breast in nitric acid, and by this means was able to demonstrate how cancer spread widely through the lymphatics of the breast and the fascia covering the muscles under the breast. He simultaneously worked out a detailed anatomy of the breast and of its lymphatics. Summing up, in 1892, his work as it applied to the operation, he writes as follows:<sup>(10)</sup>

"Recurrence of the disease after operation is due to the non-removal of small and often microscopic foci of cancer, more or less remote from the main tumour, and depending for their origin upon the arrest and growth of cancerous emboli disseminating more or less directly from the primary tumour along the lymphatics. The importance of removing all the retromammary tissue, pectoral and axillary fascia, axillary fat and glands, along with the breast in all cases of carcinoma, cannot be too strongly insisted upon or too often repeated. The anastomosis and intersection of the lymphatics are so free that it is impossible to say towards which set of glands the lymph from any given point in the breast will be conveyed. I have seen cancerous lymphatic emboli at the axillary border of the mamma when the tumour was situated in the inner hemisphere, and *vice versa*. There is no doubt also that the lymphatics of the two breasts communicate to a certain extent through a median anastomosis of both the superficial and retro-mammary lymphatics. When both breasts become cancerous, one subsequently to the other, the disease in that affected later is, in the majority of cases, probably the result of lymphatic infection, and not a primary condition. In support of this view, I may instance the case of a patient under the care of Professor Chiene, who presented herself with a second recurrence in the left breast, in the shape of a cancerous ulcer the size of a crown piece, occupying what corresponded to the lower and inner quadrant of the mammary area. There was a large cancerous mass in the corresponding axilla, and in addition two cancerous masses in the opposite or right axilla, one the size of a pigeon's egg, the other of a hazel nut. Further operative treatment was not deemed advisable; but judging merely from clinical examination, the right breast appeared to be free from cancer. In this case it would appear that the disease in the right axilla had been conveyed thither along the retro-mammary lymphatics, the breast itself having escaped."

#### Phase V: Removal of the Breast, of the Glands, and of the Pectoralis Major Muscle, 1894 to 1904.

Up to the year 1894, the free operation for carcinoma of the breast had been practised by a few surgeons only. Generally speaking, surgeons require a presentation of a series of successful cases before they will accept a new operation. Such a presentation came in 1894, when Halsted, professor of surgery at the Johns Hopkins University, recorded a series of fifty cases of radical amputation, with better results than any so far shown.<sup>(6)</sup> Halsted advocated complete removal of the *pectoralis major*, entire, or with the exception of its clavicular portion, in every case. His main contribution was to show that this step could be taken with safety, and with much better results than those previously obtained.

#### Phase VI: Removal of Less Skin and More Fascia, 1904 Onwards.

It has been shown how the researches of Thiersch, Volkman, Haidenhain and Stiles had drawn attention to the lymphatics of the pectoral fascia as one of the main avenues of spread of carcinoma of the breast.

The next step in the operation came when Sampson Handley further concentrated on this method of spread. Sampson Handley came to the conclusion that the main method of dissemination was by means of a process he called "permeation" in the lymphatics of the pectoral fascia and its continuation over adjacent muscles. As it had hitherto been thought that the skin had been one of the main avenues of spread, he was able to show that

it was not necessary to remove the huge area of skin taken by Halsted. On the other hand, he insisted that Halsted had not undermined the skin flaps sufficiently and that it was necessary to remove a much wider area of fascia.

Although Handley's work has not been entirely accepted, the operation he described is the one generally practised. A good summary of his thesis is given in any recent edition of Choyce's "Surgery", but the best description of it is given in Handley's own book, "Cancer of the Breast".<sup>(6)</sup>

It must be pointed out again that extracts have been taken only from the leading workers in this field. Many others have contributed. The names of Langhaus, Paget and Gross are a few that come readily to mind.

If this article included the whole of the treatment of carcinoma of the breast, phase VII would have to be added—namely, the use of radiotherapy both alone and in conjunction with surgery. It has seemed to us, however, that the time has not arrived for a survey of the history of radiotherapy as applied to carcinoma of the breast. The great advances made belong to the history of radiotherapy as a whole and not particularly to the treatment of the breast. Moreover, unlike surgery in this region, nothing approaching a universally acceptable technique has so far been evolved.

It may be stated, however, that the advances in surgical pathology and anatomy which have dictated the form of the modern radical operation equally determine the shape and volume of tissues to be irradiated, however the method of application may vary.

#### Summary.

1. Phase I: the histological period (up to 1860). Thiersch insisted on the derivation of cancer from epithelial cells. Waldeyer suggested that cancer spread through the lymphatics.

2. Phase II: local removal of the tumour (up to 1867).

3. Phase III: removal of the breast and of the axillary glands, advocated in 1867, by Charles Moore, "the father of surgery of the breast".

4. Phase IV: removal of the breast and of the axillary glands and of the pectoral fascia. This operation was based on the histological work of Volkmann (1874-1878), Haldenham (1889) and Stiles (1892).

5. Phase V: removal of the breast, axillary glands and pectoralis major. This development was mainly due to the advocacy of Halsted (1894).

6. Phase VI: removal of more fascia and less skin. This was in accordance with the work of Sampson Handley (1904).

#### Acknowledgement.

We are grateful for the excellent library facilities provided by the Royal Australasian College of Surgeons and for the great zeal shown by the librarian, Miss Andrew, in finding the appropriate books and journals.

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## Reports of Cases.

### PENICILLIN IN PÆDIATRICS: PRELIMINARY REPORT OF CASES OF VARYING DISEASES TREATED WITH PENICILLIN AT THE CHILDREN'S HOSPITAL, MELBOURNE.

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It is hoped that the following reports may be of some value to paediatricians and others in civilian practice who are striving to ascertain the most effective method of successfully utilizing the limited amounts of penicillin available at present.

It is the opinion of the medical staff of this hospital that the frequency of administration, the necessity of using the parenteral route, and the instability of the prepared watery solution, make the drug in its present form difficult for use outside a hospital.

The general features of its use that were noted were similar to those observed by other workers; a few are recorded below.

1. Intravenous administration is the route of choice in infections endangering life.

2. The constant intravenous drip administration of penicillin dissolved in normal saline solution and 5% glucose solution, and the injection of the concentrated solution into the tubing of the intravenous drip apparatus at intervals of three hours, were both satisfactory.

3. Thrombo-phlebitis occurs in most cases if the intravenous drip administration is continued for longer than forty-eight hours.

4. The local application of a dilution containing 250 units per cubic centimetre is the method of choice in conditions associated with infected and discharging sinuses, and it is by far the most economical method.

5. Intrathecal injection once or twice a day is the only effective method for treating the various forms of purulent meningitis.

6. Three-hourly intramuscular administration, especially to infants, is difficult, because of the limited surface area for injection; it has been found satisfactory to give the injections at intervals of six hours, once the life-endangering symptoms have been overcome.

#### Toxic Effects.

In this small series of seventeen cases, three possible toxic effects have been noted: (i) thrombo-phlebitis after forty-eight hours of continuous intravenous drip administration; (ii) irritative diarrhoea, especially in infants receiving the drug parenterally; this diarrhoea was resistant to treatment and subsided when the penicillin therapy was discontinued; (iii) transient azotæmia, which was probably due to the toxic effects of the infection itself.

None of the children complained of headache, muscular cramps, unpleasant taste or prolonged pain at the site of injection, nor did any show more albuminuria than could have been due to the toxic effects of the particular infection. No urticaria developed, and in no case was eosinophilia any more than mild.

More experienced workers will note a fairly wide variation in the duration of therapy and the amount of dosage in the present cases, but it is to be remembered that opinions, even among the most experienced, differ widely about these figures, and our work is of a semi-experimental nature.

The cases are coupled according to the type of disease treated.

#### Staphylococcus Aureus Septicæmia with Localized Osteomyelitis.

Two boys, aged respectively nine and eleven years, were treated; both were suffering from life-endangering infections (*Staphylococcus aureus* septicæmia with localized osteomyelitis).

CASE I.—A.G. was admitted to the Children's Hospital on March 12, 1944; he gave a history of pain in the right hip of two days' duration. On his admission to hospital his temperature was 105° F.; he was toxæmic and delirious. His



TABLE I.  
The Blood Picture of A.G.

Day after Admission to Hospital.	Results of Blood Count.	Urea Concentration.	Bacteriological Examination.
Third .. .. .	Hæmoglobin value: 68%. Red blood cells: 3,870,000 per cubic millimetre. White blood cells: 27,000 per cubic millimetre. Polymorphonuclear cells .. .. 60% Lymphocytes .. .. . 29% Monocytes .. .. . 11% Eosinophile cells .. .. . nil Some normoblasts		<i>Staphylococcus aureus</i> isolated from blood culture. Thirty-six hours later blood culture sterile.
Seventh .. .. .	—	38 milligrammes per 100 cubic centimetres.	Virulence test on staphylococci isolated from blood: plasma coagulated in forty minutes; sensitive to penicillin in 1/100,000 dilution.
Twentieth .. .. .	Hæmoglobin value: 66%. Red blood cells: 3,520,000 per cubic millimetre. White blood cells: 10,500 per cubic millimetre. No abnormalities in film.		
Thirty-first .. .. .	Hæmoglobin value: 70%. Red blood cells: 3,890,000 per cubic millimetre. White blood cells: 14,200 per cubic millimetre. Polymorphonuclear cells .. .. 53% Lymphocytes .. .. . 36% Monocytes .. .. . 8% Eosinophile cells .. .. . 3%		

right hip was flexed and tender. *Staphylococcus aureus* was grown on culture from the blood, and the coagulase test produced a positive result. The organism was sensitive to penicillin in a 1/100,000 dilution.

Penicillin treatment was commenced five hours after his admission to hospital; 20,000 units were given by the intramuscular route every two hours, then 25,000 units were given every three hours.

On the second day after the boy's admission to hospital his condition was worse. A transfusion of eighteen ounces of fresh blood was given, and penicillin was administered by the injection of 10,000 units every hour into the tubing of the intravenous drip apparatus. Intravenous administration was continued for twenty-four hours, and as the condition was responding, the intramuscular administration of 25,000 units every three hours was recommenced. Thirty-six hours after his admission to hospital no organisms could be grown on attempted culture from the blood. On the fifth day his temperature was normal and he was clinically well. The dosage of penicillin was halved over the twenty-four hour period, and because of the general toxic condition of the skin, 25,000 units were given intramuscularly every six hours. On the twelfth day penicillin therapy was discontinued.

On the nineteenth day mild nocturnal pyrexia occurred; it continued for the next two weeks. Therefore a double plaster of Paris spica was applied, and the temperature subsequently

fell. The child was sent home to bed for some weeks. In this case surgical intervention was contemplated, but not undertaken, because, although the lesion appeared to be somewhere in the region of the right hip joint, no localization occurred. X-ray examination failed to reveal any lesion on the first, fifth and fifteenth days; but on the twenty-second day X-ray examination revealed osteoperiostitic changes in the right femoral neck, in the intertrochanteric region and in the upper end of the femoral shaft. On the forty-third day, X-ray examination disclosed more intense bone absorption with early involucrum formation, but no further extension of inflammatory changes in the femur.

At present it is difficult to decide whether these findings indicate that the osteomyelitic process is still active, as it is reported that X-ray evidence in penicillin therapy tends to appear of more serious import than the clinical condition would indicate.

CASE II.—L.S., aged eleven years, was admitted to hospital on March 24, 1944, with a history of pain and tenderness in the left knee following trauma, of four days' duration. His temperature was 103° F. A localized inflamed area was present over the left tibia. This was diagnosed as cellulitis. He was given sulphapyridine.

On the day after his admission to hospital operation was undertaken. An incision was made and pus was drained from under the periosteum. On the third day his temperature was 104° F.; the child was toxic and delirious.

TABLE II.  
The Blood Picture of L.S.

Day after Admission to Hospital.	Results of Blood Count.	Urea Concentration.	Bacteriological Examination.
Third .. .. .	Hæmoglobin value: 68%. Red blood cells: 3,870,000 per cubic millimetre. White blood cells: 27,000 per cubic millimetre. Polymorphonuclear cells .. .. 60% Lymphocytes .. .. . 29% Monocytes .. .. . 11% Eosinophile cells .. .. . nil Some normoblasts		<i>Staphylococcus aureus</i> isolated from blood culture.
Seventh .. .. .	—	38 milligrammes per 100 cubic centimetres.	Virulence test on staphylococci isolated from blood: plasma coagulated in forty minutes; sensitive to penicillin in 1/100,000 dilution.
Twentieth .. .. .	Hæmoglobin value: 66%. Red blood cells: 3,520,000 per cubic millimetre. White blood cells: 10,500 per cubic millimetre. No abnormalities in film.		No growth.
Thirty-first .. .. .	Hæmoglobin value: 70%. Red blood cells: 3,890,000 per cubic millimetre. White blood cells: 14,200 per cubic millimetre. Polymorphonuclear cells .. .. 53% Lymphocytes .. .. . 36% Monocytes .. .. . 8% Eosinophile cells .. .. . 3%		

Culture from the blood yielded a growth of *Staphylococcus aureus*, sensitive to penicillin in a 1/100,000 dilution; the coagulase test produced a positive result. On the fourth day penicillin treatment was commenced; 25,000 units were given intramuscularly every two hours for two doses, then every three hours. (Sulphapyridine treatment was discontinued; the total amount administered was 23 grammes over eighty hours.) On the fifth day twenty ounces of fresh blood were given by transfusion, the continuous drip method being used. Penicillin was injected into the tubing in a dose of 25,000 units every three hours. The transfusion was followed by the intravenous administration of one-quarter normal saline solution in 5% glucose solution. Penicillin was administered intravenously at this rate until the tenth day, when the intravenous therapy was discontinued, a total of 155 ounces of fluid having been given. The intramuscular administration of penicillin was recommenced, 25,000 units being given every three hours.

On the thirteenth day the child's temperature was normal; 25,000 units of penicillin were given every four hours. By the fifteenth day there was clinically no evidence of infection, and the temperature had remained normal. The incision was completely healed. Penicillin treatment was discontinued on the twenty-sixth day. X-ray examination revealed osteomyelitis of the left tibia.

#### Comment.

Table III is a comparison and contrast chart of the two cases. It is too early yet to evaluate the permanence of the apparent cure of the condition.

TABLE III.  
Comparison and Contrast Chart.

Observation.	Case I (A.G.).	Case II (L.S.).
Length of history prior to admission to hospital.	Two days.	Four days.
Type of case ..	<i>Staphylococcus aureus</i> septicaemia with localized bone infection.	<i>Staphylococcus aureus</i> septicaemia with localized bone infection.
Surgical intervention	None; no localizing signs.	Incision and drainage on second day.
Blood transfusion ..	Administered as life-saving measure on second day.	Administered as life-saving measure on second day.
Initial dose of penicillin.	Large; 25,000 units every three hours.	Large; 25,000 units every three hours.
Day of commencement of penicillin treatment.	Day of admission to hospital.	Fourth day.
Sulphonamides ..	Nil.	Twenty-three grammes from first to fifth day, inclusive.
Duration of penicillin therapy.	Twelve days (including twenty-one days' intravenous administration).	Thirty days (including four days' intravenous administration).
Total amount administered.	1,435,000 units.	3,585,000 units.
Result .. ..	Life saved; osteomyelitic process apparently still active.	Life saved; osteomyelitic process quiescent. Apparent complete cure.
Conclusions ..	Adequate dosage. Inadequate duration of therapy.	Satisfactory.

#### Purulent Meningitis not Cured by Sulphonamide Therapy: Survival due Directly to Penicillin.

CASE III.—The following two children, suffering from purulent meningitis, owe their lives to penicillin. G.M., aged three years, was suffering from pneumococcal meningitis. He was admitted to the Children's Hospital with a history of having fallen from a chair three hours previously.

On examination, the child's temperature was found to be subnormal, and he was pale. The right ear was discharging cerebro-spinal fluid and blood. On the second day after his admission to hospital his temperature was 102° F. The child looked ill and restless. He was given four grammes of sulphapyridine. On the third day his temperature was 102° F. He was cyanotic, irrational and extremely ill. Lumbar puncture produced cerebro-spinal fluid containing 2,000 cells per cubic centimetre; 90% were polymorphonuclear cells and 10% lymphocytes. Culture yielded a pure growth of pneumococci. Sulphapyridine treatment was discontinued and sulphadiazine therapy was commenced, 1.5 grammes every four hours. The administration of penicillin by two routes was commenced; 10,000 units were given twice a day intrathecally and 10,000 units every three hours intramuscularly.

On the fourth day the child's condition was worse; he was irritable. The dosage of sulphadiazine was reduced to 0.75 gramme every four hours. On the sixth day the temperature was 103.5° F. and the child was dehydrated. The intravenous administration of 5% glucose solution in one-quarter normal saline solution was commenced, and penicillin was administered intravenously, 10,000 units being given every three hours into the tubing of the continuous drip apparatus. On the eighth day the temperature was 100° F. The ear was still discharging cerebro-spinal fluid. The child's clinical condition was improving. On the ninth day the temperature was 100° F. Lumbar puncture produced cerebro-spinal fluid containing 280 polymorphonuclear cells per cubic millimetre; the fluid was sterile. The intrathecal administration of penicillin was reduced to one dose per day. The child developed a squeaky voice and retention of urine with overflow. On examination, an exudate was found on the tonsils; Klebs-Löffler bacilli were grown from a swabbing.

On the tenth day the child was given 30,000 units of diphtheria antiserum. The intravenous administration of glucose and saline solution was discontinued. Lumbar puncture yielded fluid containing 180 polymorphonuclear cells per cubic millimetre. The intramuscular administration of penicillin, 10,000 units every three hours, was recommenced.

On the twelfth day the child was clinically well. No organisms were grown from throat swabbings and the voice was normal. The intrathecal administration of penicillin was discontinued. The intramuscular dosage of penicillin was reduced by one-half in the twenty-four hour period. On the fourteenth day, two days after discontinuance of the intrathecal administration of penicillin, a lumbar puncture showed that the number of cells in the cerebro-spinal fluid had risen to 350 per cubic millimetre, of which 84% were polymorphonuclear cells and 16% lymphocytes. The fluid was sterile. On the fifteenth day penicillin therapy was

TABLE IV.  
The Blood Picture of G.M.

Day after Admission to Hospital.	Results of Blood Counts.	Remarks.
Third .. .. .	Haemoglobin value: 77%. Red blood cells: 5,250,000 per cubic millimetre. White blood cells: 37,800 per cubic millimetre. Polymorphonuclear cells .. .. 88% Lymphocytes .. .. . 8% Monocytes .. .. . 4% Eosinophile cells .. .. . nil	
Eighth .. .. .	Haemoglobin value: 67%. Red blood cells: 3,630,000 per cubic millimetre. White blood cells: 13,000 per cubic millimetre. Polymorphonuclear cells .. .. 42% Lymphocytes .. .. . 46% Monocytes .. .. . nil Eosinophile cells .. .. . 12%	Blood count after administration of 500,000 units of penicillin, 230,000 intramuscularly, 160,000 intravenously and 110,000 intrathecally.
Fourteenth .. ..	Haemoglobin value: 65%. Red blood cells: 4,120,000 per cubic millimetre. White blood cells: 15,600 per cubic millimetre. Polymorphonuclear cells .. .. 53% Lymphocytes .. .. . 35% Monocytes .. .. . 7% Eosinophile cells .. .. . 5% Some normoblasts seen.	Blood count after 450,000 more units of penicillin, 60,000 intrathecally, 150,000 intravenously and 240,000 intramuscularly. The total amount given was 950,000 units.

discontinued. The temperature was normal and the child was clinically well. On the nineteenth day the temperature was normal. Sulphadiazine therapy was discontinued, a total of 81.75 grammes having been given in sixteen days. Lumbar puncture yielded cerebro-spinal fluid containing 49 cells per cubic millimetre, of which 30% were polymorphonuclear cells and 70% lymphocytes. On the twenty-fourth day, nine days after discontinuance of penicillin treatment, the cerebro-spinal fluid contained 35 cells per cubic millimetre; fifteen were polymorphonuclear cells and twenty lymphocytes. On the twenty-ninth day, nine days after the discontinuance of all forms of therapy, the cerebro-spinal fluid contained 31 cells per cubic millimetre, all of which were lymphocytes. On the thirty-sixth day the child was discharged to his home, well.

The penicillin dosage and routes of administration were as follows: intrathecally, 150,000 units were given (two injections a day for six days, once a day for four days); intramuscularly, 530,000 units were given (for the first four days and the last six days); intravenously, 320,000 units were given (from the sixth to the tenth day). The grand total amount of penicillin given by all routes was 1,000,000 units over twelve days.

Faucial diphtheria developed whilst high concentrations of penicillin were in the blood—that is, during intravenous and intrathecal administration of the drug. This fact is rather amazing, in view of the generally accepted action of penicillin against the Klebs-Löffler bacillus.

CASE IV.—G.H., aged one year and eight months, was suffering from *Staphylococcus aureus* meningitis. She was admitted to the Children's Hospital on April 17, 1944, with a history of headache and irritability of twenty-four hours' duration. On examination, her temperature was found to be 104° F.; she was irritable, but not very ill. Lumbar puncture was performed and the cerebro-spinal fluid was found to contain 87 cells per cubic millimetre, 92% being polymorphonuclear leucocytes and 8% lymphocytes. She was given sulphydryl, 1.5 grammes immediately and one gramme every four hours.

On the first day after her admission to hospital her temperature fell to 100.8° F. On the second day her temperature fell to 99.8° F. On the third day her temperature was 106° F., but the child looked much worse. On the fourth day her temperature was 99.2° F., but the child looked very ill. The cerebro-spinal fluid contained 660 cells per cubic millimetre; 87% were polymorphonuclear cells and 13% were lymphocytes. Culture from the fluid yielded a growth of *Staphylococcus aureus*; the coagulase test produced a positive result and the organism was sensitive to penicillin in a 1/100,000 dilution.

TABLE V.  
The Blood Picture of G.H.

Day after Admission to Hospital.	Results of Blood Counts.
Seventh..	Hæmoglobin value: 63%. Red blood cells: 4,060,000 per cubic millimetre. White blood cells: 37,200 per cubic millimetre. (Eosinophile cells: 3%). Film shows polymorphonuclear leucocytosis.
Fourteenth..	Hæmoglobin value: 74%. Red blood cells: 5,270,000 per cubic millimetre. White blood cells: 14,300 per cubic millimetre. Polymorphonuclear cells .. 51% Lymphocytes .. 48% Monocytes .. 6% Eosinophile cells .. 1%
Twenty-first..	Hæmoglobin value: 68%. Red blood cells: 5,210,000 per cubic millimetre. White blood cells: 11,300 per cubic millimetre. Polymorphonuclear cells .. 54% Lymphocytes .. 41% Monocytes .. 5% Eosinophile cells .. nil

On the fifth day sulphydryl treatment was discontinued. The total amount administered was 24 grammes over a period of 116 hours. Sulphadiazine therapy was commenced at the rate of one gramme every four hours. On the seventh day the child's clinical condition had improved; her temperature was 98.8° F. Lumbar puncture was performed; frank pus oozed from the needle. Examination of a smear and cultural investigation revealed *Staphylococcus aureus*. Sulphadiazine treatment was discontinued; the total amount administered was twelve grammes over a period of forty-eight hours. Sulphathiazole therapy was commenced at the rate of one gramme every four hours.

TABLE VI.  
Penicillin: Routes of Administration and Dosage.

Day after Admission to Hospital.	Dosage of Penicillin and Route of Administration.
Ninth ..	15,000 units intramuscularly 20,000 units intrathecally 80,000 units intravenously 20,000 units intrathecally 120,000 units intramuscularly
Tenth and eleventh ..	10,000 units intrathecally 45,000 units intravenously 75,000 units intramuscularly
Twelfth ..	10,000 units intrathecally 75,000 units intramuscularly
Thirteenth and fourteenth ..	10,000 units intrathecally 10,000 units intramuscularly
Fifteenth ..	45,000 units intramuscularly
Sixteenth, seventeenth and eighteenth ..	40,000 units intramuscularly.
Twentieth and twenty-first ..	20,000 units intramuscularly.
Total by intrathecal route ..	100,000 units.
Total by intravenous route ..	225,000 units.
Total by intramuscular route ..	625,000 units.
Grand total by all routes	950,000 units over thirteen days.

On the ninth day the child was desperately ill, cyanosed and having convulsions. Lumbar puncture produced thick pus, as on the seventh day, and the child had a severe convulsive seizure and respiratory collapse after the lumbar puncture. Sulphathiazole therapy was discontinued. The total amount administered was eighteen grammes over a period of forty-eight hours. Penicillin treatment was commenced; 10,000 units were given intrathecally twice a day, and 15,000 units were given intravenously by injections into the tubing of the continuous drip apparatus administering glucose and saline solution (one-quarter normal saline solution and 5% glucose solution).

On the tenth day lumbar puncture produced macroscopically clear cerebro-spinal fluid; it contained thirty polymorphonuclear cells and nine lymphocytes per cubic millimetre. The fluid was sterile. On the eleventh day the temperature was no longer swinging, but remained at a level of approximately 100° F. The child's clinical condition had improved; she was playing with her toys and talking. On the twelfth day thrombo-phlebitis developed at the site of the intravenous drip injection, so this was discontinued; the total amount of solution so administered was 130 ounces. Fifteen thousand units of penicillin were given intramuscularly every three hours. The intrathecal injections were reduced to one of 10,000 units per day. On the thirteenth day the temperature was normal, and it remained so after this day. The dosage of penicillin was halved in the twenty-four hour period; that is, 15,000 units were given intramuscularly every six hours. On the fourteenth day the

TABLE VII.  
Comparison and Contrast Chart.

Observation.	Case III (G.M.).	Case IV (G.H.).
Primary focus of infection.	Fractured skull.	Not discovered.
Day of commencement of penicillin treatment.	Third day.	Ninth day—after failure of response to sulphonamides.
Sulphonamide therapy.	Used in conjunction with penicillin.	Three sulphonamides given fair trial; administration then discontinued during penicillin therapy.
Cerebro-spinal fluid.	Contained pneumococci; cleared relatively slowly. Not completely clear on twenty-ninth day.	Contained <i>Staphylococcus aureus</i> . Cleared rapidly; completely clear after twenty-one days.
Routes of administration of penicillin.	Intestinally, intramuscularly, intravenously; intrathecally for ten days.	Intrathecally, intramuscularly, intravenously; intrathecally for seven days.
Dosage administered.	1,000,000 units over twelve days.	950,000 units over twenty-one days.
Result ..	Complete recovery. No sequelæ.	Complete recovery. No sequelæ.
Conclusion ..	Dosage and duration of therapy satisfactory.	Dosage and duration of therapy satisfactory.



cerebro-spinal fluid contained 22 polymorphonuclear leucocytes and one lymphocyte per cubic millimetre. On the fifteenth day the intrathecal administration of penicillin was discontinued. The intramuscular dose was reduced to 10,000 units every six hours. On the twenty-first day penicillin therapy was discontinued. The child was clinically well, and was discharged home a few days later.

Two months later the child was reviewed in the out-patient department; she had gained in weight and was normal in all respects. Her illness had left no sequelæ.

#### Comment.

Table VII compares and contrasts Cases III and IV.

#### Chronic Spreading Osteomyelitis of the Frontal Bone.

CASE V.—M.B., aged twelve years, was suffering from osteomyelitis of the left and right frontal bones with extradural abscesses. She was admitted to the Children's Hospital on April 18, 1944. She had a history of suppurative left frontal sinusitis following a cold thirteen weeks previously. She had been an in-patient at two Victorian country hospitals for ten weeks. Numerous incisions were made and bone was removed. She had two direct blood transfusions and two courses of sulphapyridine treatment. Forty-three days before her admission to the Children's Hospital a double pernasal anastomy was performed and sequestra of the outer table of the frontal bone were removed.

On her admission at the Children's Hospital, her temperature was 98° F. There were a mid-line incision on her forehead, exposing a quarter of an inch of bone and dura at the upper end, an incision nearer the vertex two inches long and one inch wide, and a transverse incision on the vertex.

On the day after her admission to hospital, X-ray examination revealed extensive osteomyelitis of the frontal bone, running from the frontal sinus to the bregma. The area involved was mainly in the mid-line and to the left. Culture of the pus yielded *Staphylococcus aureus*; the coagulase test produced a positive result, and the organism was sensitive to penicillin in a dilution of 1/100,000. The drainage tubes were removed and the condition was considered to be subsiding. The child's general condition was good, and no surgical intervention was indicated. Pus was still being discharged.

On the thirteenth day her temperature began to rise and the discharge increased. On the fourteenth day operation was undertaken. The right parietal bone was nibbled away, and an extensive extradural abscess from under the right frontal sinus to the vertex was exposed. A second extradural abscess was found under the left parietal bone. On the fifteenth day penicillin treatment was commenced; 15,000 units were given intramuscularly and 250 units twice a day were applied locally. The locally applied penicillin was not retained, owing to the "Vaseline" gauze packing; its use was therefore discontinued. The intramuscular administration of penicillin was continued until the twentieth day.

On the twentieth day the "Vaseline" gauze was removed and local treatment was recommenced. The discharge decreased and the temperature remained normal, the sinuses healed and the local dosage of penicillin was necessarily reduced until the thirty-first day, when it was discontinued. On the thirty-second day the intramuscular injection of penicillin was discontinued.

TABLE VIII.  
The Blood Picture of M.B.

Day after Admission to Hospital.	Results of Blood Counts.
Fifteenth (before commencement of penicillin therapy).	Hæmoglobin value: 87%. Red blood cells: 4,290,000 per cubic millimetre. White blood cells: 19,300 per cubic millimetre. Polymorphonuclear cells .. .. 66% Lymphocytes .. .. 22% Monocytes .. .. 12% Eosinophile cells .. .. nil
Thirty-seventh..	Hæmoglobin value: 108%. Red blood cells: 5,050,000 per cubic millimetre. White blood cells: 5,800 per cubic millimetre. Polymorphonuclear cells .. .. 45% Lymphocytes .. .. 45% Monocytes .. .. 6% Eosinophile cells .. .. 4%

CASE VI.—W.K., aged twelve years and six months, was suffering from osteomyelitis of the frontal bone following an infected wound. He was admitted to the Children's Hospital

on March 2, 1944, with a history of having been kicked in the left eye by a horse. Examination revealed that his temperature was 100° F. and his eye was completely disorganized. The eye was enucleated next day. On the thirteenth day after his admission to hospital the eye socket was full of pus, and pus was expressed from the incision just above the inner canthus. The temperature was elevated. On the seventeenth day X-ray examination of the frontal bone revealed no abnormality. On the twenty-seventh day a discharge was coming from the left ear. A large abscess of the nasal septum was aspirated and pus was obtained. The patient was given 43 grammes of sulphathiazole over a period of eleven days.

On the fortieth day the abscess was again aspirated. The pus yielded a growth of streptococci. From then onwards the abscess was aspirated every alternate day. The temperature was swinging mildly. On the forty-third day a further radiological examination revealed no abnormality. On the forty-sixth day spreading cellulitis of the forehead with periorbital edema was present. The temperature was 101° F. Sulphathiazole treatment was recommenced. On the forty-seventh day the temperature was 103° F. and the cellulitis was extending. On the forty-eighth day radiological examination revealed osteomyelitis of the anterior wall of the upper bony orbital margin. Operation was undertaken. Osteomyelitis of the roof of the left orbit and the left frontal bone was found. Sulphathiazole treatment was discontinued; the total amount administered was eighteen grammes over a period of seven days. On the forty-ninth day the temperature was down and the wound was draining pus. The child's clinical condition was improving, and a glass eye was fitted.

On the sixtieth day there was a recurrence of swelling and cellulitis extending up the forehead. The temperature was rising and the child was drowsy. Sulphadiazine treatment was commenced, and four grammes were given over two days.

On the sixty-second day operation was undertaken. The anterior wall of the frontal sinus was necrotic and was removed as a sequestrum. The osteomyelitic process had extended for two inches upwards from the orbit towards the vertex. A specimen of pus yielded *Staphylococcus aureus* on culture; growth was inhibited *in vitro* by a dilution of penicillin of 1/10 unit per millilitre. Penicillin treatment was commenced, 15,000 units being given intramuscularly every three hours. On the sixty-third day the "Vaseline" gauze pack was removed, and five cubic centimetres of penicillin solution (250 units per cubic centimetre) were injected locally; 830 units were given twice a day. On the sixty-sixth day the temperature was normal and the discharge was decreasing. On the seventy-second day the sinus at the side of the nose had healed over—that is, the sinus from the roof of the orbit. A discharge was still coming from the left ear. On the seventy-third day radiological examination failed to reveal any fresh sequestra. On the seventy-sixth day, as all the sinuses were healed over, local penicillin treatment was discontinued. The temperature remained normal. On the seventy-eighth day the intramuscular administration of penicillin was discontinued. Healing was complete. On the eighty-fourth day radiological examination showed that bony sclerosis was taking place.

TABLE IX.  
The Blood Picture of W.K.

Day after Admission to Hospital.	Results of Blood Counts.
Forty-fifth .. ..	Hæmoglobin value: 82%. White blood cells: 11,500 per cubic millimetre.
Sixty-fourth (two days after commencement of penicillin treatment).	Hæmoglobin value: 71%. Red blood cells: 4,890,000 per cubic millimetre. White blood cells: 9,600 per cubic millimetre. Polymorphonuclear cells .. .. 62% Lymphocytes .. .. 30% Monocytes .. .. 8% Eosinophile cells .. .. nil
Eighty-fourth ..	Hæmoglobin value: 80%. Red blood cells: 4,260,000 per cubic millimetre. White blood cells: 5,800 per cubic millimetre. Polymorphonuclear cells .. .. 39% Lymphocytes .. .. 55% Monocytes .. .. 5% Eosinophile cells .. .. 1%

The dosage and routes of administration of penicillin were as follows. From the sixty-second to the seventy-eighth day, 15,000 units were given intramuscularly every three hours—that is, a total of 120,000 units per day. From the sixty-third to the seventy-fourth day, penicillin was injected

locally twice a day according to the routine mentioned above, the dosage being decreased as the sinuses healed. The total amount administered intramuscularly over a period of seventeen days was 1,882,000 units. The total amount administered locally over a period of twelve days was 13,788 units. The grand total administered by all routes was 1,895,788 units.

#### Comment.

These two cases have many common features. M.B. (Case V) had a longer history, more extensive bone involvement and extradural abscesses. Both patients had been subjected to extensive surgical interference prior to penicillin therapy. In both cases the duration of penicillin therapy was approximately the same and the routes of administration were similar. The total dosage was larger in the more chronic case, and the result in both cases was apparently complete cure.

#### Osteomyelitis with Involvement of the Hip Joint.

CASE VII.—A.C., aged nine and a half years, was admitted to the Children's Hospital on May 19, 1944, suffering from osteomyelitis of the femur and suppurative arthritis of the left hip joint. He had fallen downstairs two days previously, injuring his left leg. The leg was radiologically examined in the casualty department on that day, and no fracture had been detected. He returned to the hospital next day. On examination, he was found to have a temperature of 103° F. He was delirious, the left leg was flexed, adducted and internally rotated. Movement was limited in all directions. There were no localizing signs, but tenderness was present over the greater trochanter.

Operation was performed. The left hip joint was aspirated and purulent fluid was obtained. The greater trochanter was drilled and some pus was liberated. Two tubes were inserted, the first down to the capsule of the hip joint and the second into the drill hole in the trochanter. The wound was packed with "Vaseline" gauze. On the first day after operation penicillin treatment was begun. Approximately ten cubic centimetres of a dilution containing 250 units of penicillin per cubic centimetre of normal saline solution were injected into the wound every four hours, and 15,000 units were injected into the deltoid muscle every three hours.

TABLE X.  
The Blood Picture of A.C.

Day after Admission to Hospital.	Results of Blood Counts.
Fifth .. .. .	Hæmoglobin value: 81%. Red blood cells: 4,640,000 per cubic millimetre. White blood cells: 9,500 per cubic millimetre. Polymorphonuclear cells .. .. 56% Lymphocytes .. .. 35% Monocytes .. .. 4% Eosinophilic cells .. .. 5%
Ninth (after 1,125,000 units of penicillin intramuscularly and 16,500 units locally—a total of 1,241,500 units).	Hæmoglobin value: 77%. Red blood cells: 4,700,000 per cubic millimetre. White blood cells: 14,800 per cubic millimetre. Polymorphonuclear cells .. .. 53% Lymphocytes .. .. 36% Monocytes .. .. 9% Eosinophilic cells .. .. 2%

By the third day the toxæmic symptoms had been controlled. The elevated temperature was subsiding and no pus was draining from the wound. On the fourth day the sinus was granulating rapidly; it was now taking only five cubic centimetres of the penicillin solution. The child's clinical condition improved rapidly, and the amount of drug used locally progressively decreased as the sinus healed. The temperature fell to normal on the sixth day, and remained so. On the thirteenth day penicillin treatment by all routes was discontinued. The leg was in a plaster of Paris spica with windows, and the child was apparently clinically well.

The nature of the lesion and the appearance of the pus suggested *Staphylococcus aureus*. Unfortunately the operation on May 30, 1944, was performed at night, and for unknown reasons the specimen of pus did not reach the pathology laboratory. When this error was detected, rectification was attempted, a little of the discharge being aspirated from the wound on the fourth day. From this *Bacillus coli communis* was grown. This is an interesting fact, as the original pus did not have the appearance or odour of *Bacillus coli communis* pus; it is thought that penicillin had already eliminated the original staphylococcus,

and that the only surviving organism (possibly a faecal contaminant of the tubes and dressing) was the *Bacillus coli communis* upon which the penicillin exerted no effect.

The dosage and routes of administration of penicillin were as follows. From the first to the third day (inclusive) 15,000 units were given locally and 120,000 units were given intramuscularly, a total of 135,000 units per day. The intramuscular dose of 120,000 units per day was continued for the total thirteen days of administration. The local dose was decreased in amount as the sinus healed, until three cubic centimetres only were necessary on the thirteenth day. The total amount given was 1,320,000 units intramuscularly and 138,200 units locally—that is, 1,458,200 units over a period of thirteen days.

CASE VIII.—J.B., aged one year and ten months, was suffering from osteomyelitis of the left femur and right tibia and suppurative arthritis of the left hip joint. The child was admitted to the Children's Hospital on March 21, 1944, with a history of pain in the right leg of three days' duration, associated with fever, and a convulsive seizure on the day of his admission to hospital. On examination, he had a temperature of 100° F.; congenital bowing of both legs and tenderness and swelling over the lower end of the right tibia were present. Operation was performed, at which an incision was made and pus was liberated from under the periosteum. The bone was drilled, the wound was filled with "Vaseline" gauze and a plaster of Paris spica was applied. Culture from the pus yielded a growth of *Staphylococcus aureus*.

On the day after operation the elevation in temperature was not subsiding; therefore the administration of sulphathiazole, 0.5 gramme every four hours, was commenced. On the tenth day temperature was persistently swinging to 103° F. or 104° F.; the cause was obscure. The plaster spica was removed and the wound was inspected; not much pus was draining from it. A wooden splint was applied. On the eleventh day radiological examination revealed osteomyelitis of the lower end of the tibia extending up the medullary cavity to the middle of the shaft. On the thirteenth day the child's temperature had not fallen. Sulphathiazole therapy was discontinued after a total of nineteen grammes had been administered over a period of twelve days. On the twenty-second day the child's condition had not improved. Attempted culture from the blood gave negative results. On the twenty-fourth day the left hip was flexed and all movements were limited. X-ray examination revealed dislocation of the left hip. Arthrotomy of the left hip was performed, and purulent fluid was drained away. A plaster of Paris spica was applied. Culture of the fluid yielded a growth of *Staphylococcus aureus*. On the twenty-fifth day the temperature subsided; it remained normal for the next two days. On the thirty-first day X-ray examination revealed that the dislocation of the left femoral head had been reduced. The discharge had decreased, and the child's discharge from hospital was contemplated.

On the thirty-seventh day his temperature began to rise steadily, and on the forty-fifth day it was swinging at 102.6° F. On the forty-ninth day the plaster spica was removed. Examination revealed no further focus; the discharge was not copious, and the leg was again put in a plaster spica. X-ray examination of the right tibia revealed involucrum formation and separation of numerous small

TABLE XI.  
The Blood Picture of J.B.

Day after Admission to Hospital.	Results of Blood Counts.
Twenty-fourth ..	Hæmoglobin value: 80%. White blood cells: 14,800 per cubic millimetre.
Forty-eighth .. ..	Hæmoglobin value: 71%. White blood cells: 20,600 per cubic millimetre. Hæmoglobin value: 102%.
Fifty-sixth (two days after blood transfusion).	Hæmoglobin value: 92%. Red blood cells: 6,100,000 per cubic millimetre. White blood cells: 18,400 per cubic millimetre. Polymorphonuclear cells .. .. 81% Lymphocytes .. .. 16% Monocytes .. .. 3% Eosinophilic cells .. .. nil
Seventy-first (day after commencement of penicillin treatment).	Hæmoglobin value: 85%. Red blood cells: 5,220,000 per cubic millimetre. White blood cells: 16,200 per cubic millimetre. Polymorphonuclear cells .. .. 58% Lymphocytes .. .. 44% Monocytes .. .. 4% Eosinophilic cells .. .. 4%
Seventy-sixth .. ..	Hæmoglobin value: 85%. Red blood cells: 5,220,000 per cubic millimetre. White blood cells: 16,200 per cubic millimetre. Polymorphonuclear cells .. .. 58% Lymphocytes .. .. 44% Monocytes .. .. 4% Eosinophilic cells .. .. 4%

sequestra. X-ray examination of the left hip showed the dislocation of the femoral head to have been reduced, but the increasing density and position suggested that it had become separated from the femoral neck, which showed evidence of osteitis. On the fifty-third day the child was given a transfusion of fifteen ounces of citrated maternal blood by the continuous drip method. On the fifty-sixth day the temperature was approximating normal, and a low-grade pyrexia remained for the next seven days.

On the fifty-eighth day radiological examination revealed that the dislocation of the left hip was still reduced. On the sixty-eighth day the child's temperature rose to 103° F. Copious pus drained into the plaster cast. On the seventieth day operation was undertaken; sequestrectomy and curettage were performed. A granulating cavity was found in the right tibia, and a rubber tube was inserted. A rubber tube was also inserted down to the femoral head of the left hip. A double plaster spica with windows was applied. Penicillin treatment was commenced at the rate of 10,000 units every three hours intramuscularly and locally injected into the tubes in the right tibia and the left femur. Approximately three cubic centimetres were inserted into the tube in the right tibia and approximately seven cubic centimetres were inserted twice a day into the tube in the left femur. The dilution of penicillin was 50 units per millilitre. On the seventy-fifth day the temperature was normal. On the seventy-sixth day the intramuscular dosage was reduced to 10,000 units every six hours. On the eighty-fifth day the intramuscular dosage was reduced to 5,000 units every six hours.

On the eighty-seventh day, under general anaesthesia, the cavities were explored and found to hold only a few cubic centimetres of penicillin. The tubes were reinserted and the local administration of penicillin was continued. The intramuscular use of penicillin was discontinued. Sinuses completely healed and the child was discharged from hospital.

The dosage and routes of administration of penicillin were as follows. Ten thousand units were given intramuscularly every six hours—that is, 40,000 units per day daily for eight days; 5,000 units were given intramuscularly for four days, then the intramuscular administration was discontinued. The total amount administered intramuscularly was 80,000 units over a period of eighteen days. The total amount administered locally up to June 18, 1944, was 980,000 units. The total amount given by all routes was 1,790,000 units. Local treatment is proceeding.

#### Comment.

A.C. (Case VII), who is to this date apparently completely cured, has been sent home in a plaster of Paris hip spica, in order to determine whether and in what period bony regeneration at the site of the lesion will occur.

#### Fulminating Meningococcal Septicæmia.

The following two case reports are of infants suffering from fulminating meningococcal septicæmia. In the first case no sulphonamides were administered, because our clinical experience here has led us to the conclusion that before the introduction of penicillin, this type of lesion, associated with the typical rapidly spreading blotchy rash and coma a few hours after onset, was almost invariably fatal. In the second case penicillin was administered as a life-saving measure after sulphonamide therapy had failed to improve the clinical condition.

CASE IX.—R.W., aged five months, was admitted to the Children's Hospital on June 6, 1944, suffering from meningococcal septicæmia. He had a history of coryza of two weeks' duration. Twelve hours before his admission to hospital he vomited, and nine hours later a petechial rash began to appear. On examination, he was found to have a temperature of 102.2° F. His skin was ashen-grey, with generalized purplish blotches and petechiæ. There was no neck stiffness, and Kernig's sign was not elicited.

Three-quarters of an hour after his admission to hospital penicillin treatment was commenced. Ten thousand units were given intravenously at intervals of three hours, the drug being injected into the tubing of a continuous intravenous drip apparatus administering normal saline solution. Culture from the blood yielded a growth of meningococci. The organism was sensitive to a dilution of 1/16 unit per millilitre of penicillin. Lumbar puncture was performed; the cerebro-spinal fluid contained 58 polymorphonuclear cells per cubic centimetre, and yielded meningococci on culture.

On the day after his admission to hospital the child's condition was improved, and the petechiæ were fading. On the second day the intravenous administration of saline solution was discontinued after a total of 37 ounces had been

given. Penicillin was given intramuscularly at the rate of 10,000 units every three hours. On the fourth day the temperature was lower and the child's condition was much improved. Attempted culture from the blood gave negative results. Therefore, the intramuscular dose of penicillin was reduced to 5,000 units every three hours. On the seventh day the elevation of temperature was subsiding by lysis. On the thirteenth day the temperature was normal, and the child was clinically well. The dosage of penicillin was reduced to 5,000 units every six hours. On the fifteenth day penicillin treatment was discontinued. On the nineteenth day the child was discharged home, well.

The dosage and routes of administration of penicillin were as follows. Intravenously, 245,000 units were given over a period of forty-eight hours. Intramuscularly, injections were given every three hours for eleven days, and every six hours from the thirteenth to fifteenth day. The total amount given by the intramuscular route was 650,000 units over a period of thirteen days. The grand total given by all routes was 895,000 units over a period of fifteen days.

CASE X.—J.B., aged eighteen months, was admitted to the Children's Hospital on June 7, 1944, suffering from meningococcal meningitis with septicæmia. He had a past history of pink disease. His illness had commenced two days previously with "cold shivers", irritability, feverishness and pallor. On examination, his temperature was found to be 103.4° F. He was pale and semi-conscious and had a generalized petechial rash. No neck stiffness was present and Kernig's sign was not elicited. The cerebro-spinal fluid contained numerous polymorphonuclear cells and meningococci. The organisms were sensitive to penicillin in a dilution of 1/16 unit per millilitre.

One hour after his admission to hospital the administration of one-quarter normal saline solution and 5% glucose solution was commenced. "Dagenan", one gramme, was administered intravenously at intervals of four hours. Twenty hours later the clinical condition was deteriorating; the child vomited brownish fluid and the rash became more blotchy. The temperature was 99° F. and the depth of coma had increased. "Dagenan" therapy was discontinued. A total of seven grammes had been administered over twenty-four hours. Penicillin treatment was commenced; 15,000 units were given at once, then 10,000 units every two hours injected in concentrated solution into the tubing of the continuous intravenous drip apparatus.

On the second day after the child's admission to hospital his temperature was 99° F. No further vomiting had occurred. The child was drowsy, but no longer comatose, and the rash was fading. The intravenous administration of glucose and saline solution was discontinued, and penicillin was given intramuscularly in a dosage of 10,000 units every three hours. On the third day the temperature was normal. The intramuscular injections were reduced to 10,000 units every six hours. Considerable clinical improvement was evident. On the fifth day the child was taking feedings well and talking. The rash had entirely disappeared. The dosage of penicillin was reduced to 5,000 units every six hours. On the sixth day lumbar puncture was performed. The cerebro-spinal fluid contained 17 polymorphonuclear cells and 27 lymphocytes per cubic centimetre. On the tenth day the child was sitting up and playing with his toys. His temperature was normal. Penicillin treatment was discontinued. On the fourteenth day he was discharged home, clinically well.

The dosage and routes of administration of penicillin were as follows. Intravenously, 10,000 units were given every two hours, to a total of 115,000 units. Intramuscularly, 10,000 units were given every three hours for ten doses, then 10,000 units every six hours for three doses, and then 5,000 units every six hours for 24 doses, when the treatment was discontinued. The total amount of penicillin given by the intramuscular route was 240,000 units. The grand total given by all routes was 355,000 units over a period of ten days.

#### Osteomyelitis of the Lower End of the Femur: Acute and Chronic.

CASE XI.—R.A., aged three and a half years, was admitted to the Children's Hospital on May 9, 1944, with a history of pain in the left thigh and fever of two days' duration. On examination, he had a temperature of 105.2° F. The left hip was flexed, abducted and externally rotated. Movements were free and painless. The lower part of the thigh was swollen and red. At operation pus was liberated from under the periosteum at the lower end of the left femur and the bone was drilled. Sulphadiazine treatment was commenced. On the second day after his admission to



hospital the child was cyanotic and vomiting; his temperature was 101° F. Sulphadiazine treatment was discontinued after seven grammes had been given in thirty-six hours. Pus from the femur yielded a growth of *Staphylococcus aureus*; the coagulase test produced a positive result, and the organism was sensitive to penicillin in a dilution of 1/64 of a unit per millilitre. On the fifth day after his admission to hospital his temperature was rising and a copious discharge was coming from the affected area.

On the sixth day operation was undertaken. Under general anaesthesia three rubber tubes were inserted, two into drill holes in the femur and one into the soft tissue of the wound. The skin edges were sutured together with silk-worm gut and a "Vaseline" gauze dressing was applied. The leg was encased in a plaster of Paris spica with windows. Penicillin treatment was commenced: 10,000 units were given intramuscularly every three hours; two cubic centimetres of a solution containing 250 units per millilitre were given into each tube every four hours—that is, 15,000 units every four hours. The temperature subsided by lysis.

The eighth day marked the onset of what was considered to be irritative diarrhoea; the child passed loose, offensive stools containing mucus. The diarrhoea was resistant to ordinary treatment, but subsided after a reduction of the dosage of penicillin. An attempt at culture from the faeces was made, but no pathogenic organisms were found. On the fifteenth day the morning temperature was normal, and considerable clinical improvement was obvious. The intramuscular dose of penicillin was reduced to 5,000 units every three hours. The local dose was gradually diminishing in amount to three or four cubic centimetres. The urine was tested, but no abnormalities were found. On the sixteenth day all sutures were removed. The wound edges had completely healed. On the nineteenth day the haemoglobin value was 62%. A transfusion of seventeen ounces of paternal citrated blood was given by the continuous intravenous drip method. The intramuscular administration of penicillin was continued throughout. On the twenty-sixth day the child's temperature was normal; it remained so thereafter. On the twenty-seventh day the cavity held 0.5 to 1.0 cubic centimetre of penicillin solution; therefore local administration was discontinued and the tubes were removed. On the twenty-ninth day the intramuscular injections were reduced to 5,000 units every six hours. On the thirty-second day the temperature was normal and the child was clinically well. Penicillin treatment was discontinued. On the thirty-fifth day X-ray examination revealed extensive osteitis and periostitis of the lower half of the femoral shaft. On the thirty-seventh day the child was discharged home, in a plaster hip spica.

The dosage and routes of administration of penicillin were as follows. Locally, a solution of 250 units per millilitre was injected into each tube every four hours; the amount was decreased as the cavity healed. The total amount administered by this route was 132,925 units over a period

of twenty days. Intramuscularly, 10,000 units were given every three hours for nine days (80,000 units per day); then 5,000 units were given every three hours for fourteen days (40,000 units per day); then 5,000 units were given every six hours for four days (20,000 units per day). The total amount administered by this route was 1,350,000 units. The grand total given by all routes was 1,482,925 units over a period of twenty-seven days.

CASE XII.—K.M., aged thirteen years, was admitted to the Children's Hospital on May 29, 1944, suffering from chronic osteomyelitis of the lower end of the right femur. She had suffered from osteomyelitis of the lower end of the right femur since March 25, 1943. The condition had been treated first by immobilization in plaster of Paris and later in a walking caliper; but in November, 1943, sequestrectomy was performed. Since that time she had had a chronic discharging sinus on the postero-lateral surface of the right femur approximately four inches above the knee.

On the day after her admission to hospital operation was performed. A large sequestrum representing portion of the distal shaft of the femur was removed. The wound was left open and a plaster of Paris splint was applied. From the first to the tenth day a copious, offensive, purulent discharge poured from the wound. The temperature was not elevated, and the child's general condition was fairly good. Culture from the pus yielded a growth of *Staphylococcus aureus*. On the twelfth day a further operation was performed. The cavity was syringed, and rubber tubes were inserted. The skin edges about the wound were sutured and a "Vaseline" gauze dressing was applied. Penicillin treatment was then commenced; 10,000 units were given every three hours intramuscularly; a dilution of 250 units of penicillin per cubic centimetre was injected into each of the tubes every four hours. The total initial quantity given locally was approximately ten cubic centimetres.

On the eighteenth day the amount given by intramuscular injection was reduced to 10,000 units every six hours. The local amount of penicillin was reduced as the cavity healed in. The child was comfortable, her temperature was normal and no toxic effects were apparent. On the twenty-first day the dressing was removed and the wound was found to be clean and healing. The silk-worm gut sutures were removed and three tubes were withdrawn, one tube only being left. The cavity was syringed with saline solution; its capacity was six cubic centimetres. On the twenty-fourth day the intramuscular administration of penicillin was discontinued, but the local administration was continued at intervals of four hours as above. The wound was clean and granulating. There was no discharge, a clear return being obtained after the cavity was syringed with saline solution. Treatment is proceeding.

The dosage and routes of administration of penicillin were as follows. Intramuscularly, 10,000 units were given every three hours for the first seven days, then 10,000 units every six hours for six days; the total amount administered by this route was 720,000 units. Locally, a dilution of 250 units per cubic centimetre was injected into the cavity every four hours; the total amount administered up to the twenty-fourth day was 150,300 units. The grand total given by all routes up to the twenty-fourth day was 870,300 units.

#### Comment.

In the acute case (Case XI), a prognosis of fairly speedy return to full activity seems reasonably assured, provided extension of the inflammatory lesion does not occur. Surgical intervention was undertaken at an early stage; therefore it is hoped that bone destruction has been minimized. With regard to Case XII, extensive bone destruction with extrusion of a large sequestrum had occurred prior to the institution of penicillin therapy, and some considerable time must elapse before regeneration has consolidated sufficient osseous tissue to permit of any weight bearing.

In these two cases, as in those previously mentioned, time alone will test the value of our present apparent cures.

#### Diphtheria.

On one occasion, having one cubic centimetre of a dilution of penicillin (5,000 units per cubic centimetre) remaining in the ampoule at the conclusion of treatment of a patient suffering from meningitis, we decided to determine the efficacy of the drug against the Klebs-Löffler bacillus in four cases, two of which were causing some anxiety at that time, owing to persistence of the organism in swabbings and the consequent deterioration in the patients' general condition. A dilution of 250 units per millilitre was prepared and administered as nasal guttae to three patients, at intervals of three hours, with the remarkable results presented in Table XIII.

TABLE XII.  
The Blood Picture of R.A.

Day after Admission to Hospital.	Results of Blood Counts.
Third .. .. .	Haemoglobin value: 101%. Red blood cells: 5,020,000 per cubic millimetre. White blood cells: 28,900 per cubic millimetre. Polymorphonuclear cells .. .. 68% Lymphocytes .. .. 26% Monocytes .. .. 6% Eosinophile cells .. .. nil
Seventh.. .. .	Haemoglobin value: 87%. Red blood cells: 5,060,000 per cubic millimetre. White blood cells: 29,200 per cubic millimetre. Polymorphonuclear cells .. .. 81% Lymphocytes .. .. 14% Monocytes .. .. 5% Eosinophile cells .. .. nil
Fourteenth .. .. .	Haemoglobin value: 62%. White blood cells: 8,600 per cubic millimetre.
Twentieth (after 17 ounces of fresh blood).	Haemoglobin value: 96%. Red blood cells: 5,510,000 per cubic millimetre. White blood cells: 8,600 per cubic millimetre. Polymorphonuclear cells .. .. 75% Lymphocytes .. .. 23% Monocytes .. .. 2% Eosinophile cells .. .. nil
Twenty-fifth .. .. .	Haemoglobin value: 97%. Red blood cells: 5,150,000 per cubic millimetre. White blood cells: 14,800 per cubic millimetre. Polymorphonuclear cells .. .. 44% Lymphocytes .. .. 45% Monocytes .. .. 8% Eosinophile cells .. .. 3%

TABLE XIII.

Name of Patient.	Age.	Initial Disease.	Period during which Organisms were Present in Swabbings.	Treatment Prior to Penicillin Therapy.	Mode of Administration of Penicillin.	Result.	Follow-up After Cessation of Treatment.
L.H.	Three months.	Congenital syphilis.	Nasal swab, 33 days.	20,000 units of diphtheria antiserum and nasal toilets every four hours; argyrol drops twice a day, and later mercurochrome drops three times a day.	Nasal drops every three hours for 48 hours.	No organisms found on nasal swab after 24 hours.	No organisms found on swabs during next 14 days.
G.C.	Eleven months.	Colic disease.	Nasal swab, 12 days.	4,000 units of diphtheria antiserum and sulphathiazole drops every four hours.	Nasal drops every three hours for 48 hours.	No organisms found on nasal swab after 24 hours.	No organisms found on swabs during next seven weeks.
T.K.	Ten weeks.	"Snuffles" and rhinorrhoea since birth.	Probably from soon after birth; organisms present in nose and throat for 30 day in hospital.	4,000 units of diphtheria antiserum, nasal toilets, "M & B 125", 0.5 gramme every four hours; gentian violet drops twice a day.	Nasal drops every three hours for 48 hours.	No organisms found on throat swab after 24 hours, or on nasal swab after 48 hours.	No organisms found on nose and throat swabs during next ten weeks.
E.L.	Nine years.	Meningitis.	Throat swab, 31 days.	15,000 units of diphtheria antiserum perchloride of mercury gargles, hydrogen peroxide gargles, gentian violet paint to throat every four hours.	Fauces painted with small brush dipped in penicillin solution.	No organisms found on throat swab after 24 hours.	No organisms found on swabs during next seven days. Relapsed on seventh day and received treatment with penicillin for further 48 hours.

In three cases the Klebs-Löffler bacillus infection was contracted whilst the patient was in hospital under treatment for another condition.

If these results are representative of the remarkable sensitivity of the Klebs-Löffler bacillus to dilutions of penicillin such as were used, the period of isolation of such patients must be enormously decreased, and it is a matter for speculation whether the person who is a "carrier" of diphtheria will require isolation and retention in hospital.

Attention is drawn to Case III (G.M.), in which the Klebs-Löffler bacillus was found on a throat swab whilst the child was undergoing intravenous therapy. It is suggested that the apparent paradox may be overcome by the observation that in the four last-mentioned cases treatment was local and directed to the primary focus of infection.

#### Conclusions.

Penicillin is of particular value in paediatrics, in which fulminating infections are not infrequently encountered; its rapid action in such cases makes it effectual when the sulphonamides fail.

A child, though having little immunity to organisms normally resisted by the adult, nevertheless has remarkable recuperative powers if an agent is found to inhibit and combat the initial overwhelming infection, and in the cases under discussion this agent was penicillin.

Children tolerate the drug exceedingly well, and although the dosage varied greatly in these cases, toxic effects were minimal. In all cases penicillin stained the urine, and it is interesting to speculate whether this observation represents excretion of surplus concentration of the drug from the blood—that is, overdosage and wastage.

Patients suffering from osteomyelitis, either acute or chronic, respond rapidly to penicillin treatment, and the follow-up of these patients will determine whether this response is permanent.

#### Summary.

The following infections successfully treated with penicillin are discussed: (i) *Staphylococcus aureus* septicaemia with localized bone infection (two cases); (ii) purulent meningitis (two cases); (iii) chronic osteomyelitis of the frontal bone (two cases); (iv) osteomyelitis with involvement of the hip joint (two cases); (v) meningococcal septicaemia and meningitis (two cases); (vi) osteomyelitis of the lower end of the femur (one acute case and one chronic case); (vii) nasal and faucial Klebs-Löffler bacillus infection treated by local application of penicillin (five cases, four in infants).

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My thanks are due to the honorary medical staff of the Children's Hospital, Melbourne, for permission to present

these cases, also to Miss M. Green, of the pathological department, for the large amount of laboratory work entailed in the investigations.

#### A CASE OF MALARIA ACQUIRED NEAR SYDNEY, NEW SOUTH WALES.

By JEAN M. COLLIER, B.Sc., M.B., B.S.,  
Pathologist, the Women's Hospital, Crown Street,  
Sydney.

#### Clinical Record.

E.W., aged twenty-four years, was admitted to the Women's Hospital, Crown Street, for investigation on February 20, 1944. She was seven months pregnant and had been well during her pregnancy until the morning of February 4, when she had a "shivering attack". These attacks recurred every second day for one week, and then every day until her admission to hospital, and each attack occurred between 10 a.m. and 12 noon. Her only other complaint was of pains in the legs.

Blood was taken for examination on February 21 in the morning. The temperature was 100.4° F., but the patient had no rigor that morning. The erythrocytes numbered 3,050,000 per cubic millimetre and the haemoglobin value was 8.7 grammes per centum. The leucocytes numbered 6,000 per cubic millimetre; 47% were neutrophile cells, 16% band-form neutrophile cells, 25% lymphocytes and 11% monocytes. Anisocytosis of the red cells was noted and an occasional nucleated red cell was seen. Malarial parasites were present in both sexual and asexual forms in moderate numbers in the thin film. The opinion of Dr. George Heydon, of the School of Public Health and Tropical Medicine, was sought, and the diagnosis of benign tertian malaria was confirmed.

The patient has responded well to treatment with quinine and "Atebrin", becoming afebrile and symptomless within three days. Malarial parasites have disappeared from the blood and the pregnancy is continuing satisfactorily.

#### Comment.

The patient has lived near Sydney all her life—at Abbotsford, Kogarah, Canley Vale and Ashfield, and for the last nine months at Fairfield. She has been for short holidays into the country, the last, three years ago, to Kurri Kurri, and she has never been further north than this town. Her husband was in the army for three months, but has not been outside New South Wales, except for a holiday in Queensland six years ago. None of her friends are known to have had malaria, nor does she know of any malaria sufferers in her neighbourhood, though she admits that her knowledge in this direction is limited. She states

that there are "not many" mosquitoes near her home. She has never had any previous similar attacks, her previous illnesses being measles, "gastric influenza", and a high temperature after the birth of her first child eighteen months ago.

In 1931, Dr. E. L. Morgan<sup>(1)</sup> reported a case of malaria occurring in Sydney and tabulated six other cases reported in New South Wales since 1915. Dr. A. H. Tebbutt<sup>(2)</sup> more recently reported an infection contracted at Bega, New South Wales, and issued to the medical profession a warning for alertness regarding malaria.

#### Acknowledgement.

My thanks are due to Dr. T. Dixon Hughes, under whose care the patient was admitted to hospital, for permission to publish this report.

#### References.

<sup>(1)</sup> E. L. Morgan: "A Case of Malaria Acquired in Sydney, New South Wales", Annual Report of the Director-General of Public Health, New South Wales, 1931-2, page 131.

<sup>(2)</sup> A. H. Tebbutt: "Malaria Contracted in Southern Australia", THE MEDICAL JOURNAL OF AUSTRALIA, May 22, 1943, page 476.

## Reviews.

### A YEAR BOOK OF GENERAL MEDICINE.

"THE 1943 YEAR BOOK OF GENERAL MEDICINE" has made its appearance and will be welcomed by the many practitioners who look for the volume each year. Though the general get-up of the volume has been determined to a large extent by the rulings of the "War Production Board" in the United States, the result is pleasing in every way and the explanatory note that appears in the early pages is really not necessary.

As usual the book is divided into several parts. Part I, devoted to infectious diseases, is edited by G. F. Dick; it takes up 124 pages. A section deals with military and tropical medicine. Reference is made to epidemiology in wartime and also to war and migration of tropical diseases. It is not clear why an abstract on the bacteriology of war wounds has been included here. In a fairly long section on influenza a lengthy abstract of an article by Thomas Francis on the epidemiology has been included. In the section on malaria prominence is given to the views of L. T. Coggeshall on malaria as a world menace and to those of Manson-Bahr on malaria in wartime. In the section on typhus the paper by F. M. Burnet on the evolution of the rickettsiae, published in this journal, is abstracted, and mention is also made of J. W. Fielding's contribution on the modified Breinl method for staining rickettsiae and other inclusions.

Diseases of the chest (exclusive of the heart) are dealt with in 172 pages; J. Burns Amberson, junior, is the editor. Perhaps the most important section of this part of the volume is the opening section on normal and abnormal physiology. The views of Rossier and Méan, of Zurich, on pulmonary insufficiency are given pride of place, and the editor regards them as so important that he advises that they should be studied in the original article which appeared in the *Schweizer medizinische Wochenschrift*. It is interesting to note that several of the articles mentioned in this section appeared in surgical journals. Non-bacterial pneumonia and unclassified pneumonia are discussed at some length.

The section on diseases of the blood and blood-forming organs and diseases of the chest is edited by G. R. Minot and W. B. Castle. After a section on general considerations the different types of anaemia are dealt with in turn, and follow references to polycythemia, infectious mononucleosis, leuchemias, purpura and hemophilia. In the section dealing with diseases of the kidney reference to the views of G. W. Thorn on physiological considerations in the treatment of nephritis will be found interesting.

The section on diseases of the heart and blood vessels has been edited by W. D. Stroud. It is subdivided into sub-

sections in which aetiological diagnosis, anatomical diagnosis and physiological diagnosis are dealt with. Then follow references to electrocardiography, treatment *et cetera*.

The section on diseases of the digestive system and of metabolism is the last in the book; it is edited by G. B. Eusterman. Prominence has been given to articles dealing with military medicine and tropical conditions. Reference is made also to an article by W. D. Paul, who, unlike other observers, finds that aspirin does not produce hyperaemia or haemorrhages in the gastric mucosa. Work on the genesis of peptic ulcer by S. Wolf and H. G. Wolff is described as "one of the most convincing pieces of research concerned with ulcer genesis in all recorded literature". (This work was discussed in this journal in the issue of February 20, 1943.)

It will be noted that no reference is made to the central nervous system; this is dealt with in a separate year book. The same statement applies to conditions of the thyroid for which search has been made in vain.

This volume is a mine of useful information and is warmly recommended.

### RORSCHACH'S TEST.

To most doctors a review of Beck's book on the basic processes of the Rorschach test would be of little moment.<sup>1</sup> This may be a reflection on the rather backward state of modern psychological practice in this country, but it justifies reference to the Rorschach test in general terms.

The validity and development of any test are established through three phases. There is firstly the formulation of the purpose of the test; secondly, the devising of the method of the test; and thirdly, the assessment of the results of the test in relation to its purpose. As a corollary, any test which survives these phases results in a method of recording and comparing observations with some degree of mathematical exactness. These phases are aptly illustrated in the value now attached to hemoglobin readings. These were derived initially from the investigation of the problem of anaemia.

The absence of such tests and measurements in the psychological realm has led to an inability to give the same exactitude to clinical phenomena as pertains in other branches of clinical medicine. Some success, however, has been attained with intelligence tests. Difficulties ensued when attempts were made to test and measure emotions and other forces which are vital and very significant in moulding the personality in health and disease. It was to this end that the Rorschach test was devised. It was hoped to shed light on the deeper forces of the personality. This was its purpose.

The second phase was the devising of the test. This consists in showing the person to be tested a series of ten cards on which are outlined seemingly meaningless, ink blots. The person is asked to say what he sees in them. Later the reasons for his replies are discussed with him. The obvious advantages of the test are twofold: the subject is unaware of the significance of his replies and the same test material is given to everyone. The main difficulty arises because of the extreme variation in the possible replies.

The third stage is to ascertain whether the replies do give important information on personality factors, and if so, what is their value.

This book is concerned with the second phase. It is an attempt to standardize the replies of the persons tested to the ink blots. The conclusions outlined have obviously been based on a considerable number of replies. The types of response have been classified into such groups as response to the whole blot, attention to detail, colour, movement *et cetera*. These responses are scored with symbols. The further dissection and correlation of these groups are also considered. This book is the clearest exposition on this aspect of the test. For this reason it would be most valuable for those psychologists training in this work.

The book does not deal with the evaluation of the test in relation to the purpose for which it was devised. It does not attempt to correlate the responses with personality structure nor to indicate in which type of mental disorder the test is of most value. It is only when this stage has been reached that judgement can be passed on its clinical value.

<sup>1</sup> "The 1943 Year Book of General Medicine", edited by George F. Dick, J. Burns Amberson, George R. Minot, William B. Castle, William D. Stroud and George B. Eusterman; 1943. Chicago: The Year Book Publishers, Incorporated. 7" x 4½", pp. 784, with illustrations. Price: \$3.00.

<sup>1</sup> "Rorschach's Test: 1. Basic Processes", by Samuel J. Beck, Ph.D., with a foreword by Willard L. Valentine, Ph.D.; 1944. New York: Grune and Stratton. 5" x 6", pp. 231. Price: \$3.50.



# The Medical Journal of Australia

SATURDAY, AUGUST 26, 1944.

*All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.*

*References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.*

*Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.*

## WANTED: A MEDICAL HISTORIAN.

To win the present war is vital. That none among us will deny. When it has been won, and we are all in great heart that it soon will be, there will remain an aftermath full of problems and complexities. War and the post-war period are a time of testing for any nation, and because of its comparative youth among other nations Australia will be the more severely tested in spite of its distance from the major conflict in Europe. After the war of 1914-1918 it was commonly said that on the slopes of Gallipoli, in the sands of the desert and on the fields of France Australia had found her manhood and had taken her place among the nations of the earth. Though everyone may not agree that before 1914 Australia was as it were in the adolescent stage, there is no doubt that what became known as the Great War left its mark on Australia and the character of her people. Though it has been held that a nation is happy whose annals are a blank, the truth of the statement may be questioned. Nations, like the individuals composing them, learn by experience, and they build their character by the knocks they take and the difficulties they overcome. The present war has brought a change into the life of almost every citizen. In proportion as the citizens of the Commonwealth have shouldered their burdens and borne them cheerfully, the national character has been strengthened. The history of a nation tells us of its origin, its development, its trials, its difficulties, its failures and its triumphs. From a national history it should be possible to trace the influences that have been at work, to judge the quality of leadership in a community, to assess the national conscience, to discover why faults and failures have occurred, to learn the reason for prejudice and suspicion when they have arisen. Such a history should be a stimulus to future activity and also

a safeguard against error and default—in other words it should be “the chart and compass for national endeavour”.

After the war of 1914-1918 the Official History of the war was published, the historian being Dr. C. E. W. Bean. Everyone recognized Dr. Bean's ability and agreed that no better appointment could have been made, and the volumes that he produced bear witness to this opinion. The official history of the Australian Army Medical Services was published in three volumes under the title “The Australian Army Medical Services in the War of 1914-1918”. This work, as explained by the historian, Colonel A. Graham Butler, D.S.O., in the preface to the third volume, was in its conception, its design and its execution part of the general project of the “Australian Official History”. In other words it “came within the responsibility” of the General Editor, Dr. Bean. Of the value of Colonel Butler's work there can be no doubt; the view held by the medical profession of Australia in regard to it is clear from the fact that Colonel Butler has been awarded the gold medal of the British Medical Association in Australia as a mark of appreciation. The work of compiling a history of the medical services of Australia in a world war is enormous, and the task of a man chosen for the work unenviable. After the last war there was much delay in the publication of the medical history, a delay described by Colonel Butler himself as unconscionable and reprehensible. Many factors contributed to this delay, and it is common knowledge that too great a task was imposed on Colonel Butler himself, and that he worked under a heavy handicap. The present war is about to enter its sixth year, and no announcement has been made about the appointment of a medical historian. Rumours have been current regarding such an appointment, but the rumours have been heard for too long; it is time that something was decided. Neither this journal nor the profession at large has any wish to act as an irritant in this matter, but there is a feeling of uneasiness that time and opportunity are being frittered away. The longer the delay in the making of an appointment, the greater will be the difficulty in the collation of the material on which the historian will work. The task of the medical historian will be greater this time than it was last, because of the larger parts that have been taken by the medical services of the Royal Australian Navy and the Royal Australian Air Force; this makes the appointment of a medical historian all the more urgent. It should be pointed out that Great Britain has already appointed its medical historian in the person of Sir Arthur McNalty, who was until recently chief medical officer of the Ministry of Health. In Australia the authorities have appointed as official war historian Mr. Gavin Long, a journalist of wide experience. If, as we may assume, the medical history of this war is to be part of the general project of the “Australian Official History”, it is unreasonable, seeing that Mr. Long is already at work, to hold up the appointment of a medical collaborator.

A suitable medical historian may be hard to find. Everyone will wish the medical history to be a work of merit, a work that will not only be a record of achievement and a memorial to those who gave their lives in the medical services, but will also be “a chart and compass” for the medical services of the Australian fighting forces of the future. This means that Australia should not be content with mediocrity. Carlyle said that histories are perfect as the historian is wise and is gifted with an eye

and a soul. Though it is doubtless not attainable, the aim should none the less be for perfection. The first requirement in a medical historian should be a sound general knowledge of medicine. The history will be primarily medical, and one of its chief functions will be to demonstrate the relative importance of different diseases from the service point of view. The historian should be able to determine this from his own knowledge and experience. The work will be a more uniform production if this is done than if many persons have had a share in the scientific side. If the historian requires help he should be allowed to choose his collaborators and should not have them thrust upon him. The second point to be emphasized is that the appointee should have behind him a wide experience in one or other of the services. No civilian, however wise he might be, would be qualified to write a history of the services. The next point is that the historian must have an orderly mind that he be not overwhelmed by an enormous mass of relevant data. More than that, he will need to be precise and unprejudiced, uninfluenced alike by fear or favour, by antipathy or preference. Lastly, the historian should have a knowledge of English and be able to write simply of medical matters without recourse to clinical jargon. Altogether our medical historian has to be a man of unusual gifts and attainments. While a search is made for him it will be well to remember that the ideal man will be hard to find; he may not even exist. Macaulay wrote that to be a really good historian was perhaps the rarest of intellectual distinctions. If a suitable man is found he will need to be well remunerated and to be given all the assistance and all the facilities that are necessary; otherwise the success of his work will be prejudiced and in the long run the whole people of the Commonwealth will be the losers.

### Current Comment.

#### CIRCULATORY FAILURE IN ACUTE NEPHRITIS.

Those specially interested in the treatment of patients suffering from acute nephritis are well aware of the dangers of circulatory failure, for serious embarrassment of the heart and circulation may occur and substantially alter the prognosis. J. S. La Due, in a study of congestive heart failure as a factor in the production of oedema in acute glomerulonephritis, begins his article by quoting numbers of authors on this point.<sup>1</sup> The percentage of cases in which cardiac insufficiency is found varies greatly in the different series, but excepting that reported by Whitehill and others in which this complication was present in 71% of 138 cases, the usual figure ranges from 20% to 40%. This is no academic matter, for it is not only a question of finding an explanation for the heart failure, since the much more important consideration of diagnosis and treatment of the condition is involved. The hypertension which is almost constantly found in patients with glomerulonephritis has been considered to be one of the important possible causes of heart failure, but cases have been reported in which no significant hypertension has been observed. Occasionally congestive failure has been observed before the appearance of hypertension, and there is only a certain degree of correlation between the severity of the failure and the degree of elevation of blood pressure. There is no real evidence that an essential myocardial factor exists. La Due remarks that if the concept that

glomerulonephritis is in reality part of a general capillary disease was accepted, a plausible hypothesis based on capillary changes could easily be advanced. He further points out that most patients who suffer from this cardiac complication also show peripheral oedema, and his study has been based on this association of symptoms. Twelve patients suffering from acute glomerulonephritis with general oedema were placed on standard conditions and fully investigated with regard to all the ascertainable facts concerning circulatory and renal function. In every case there was some evidence of failure of the right side of the heart indicated by an elevated venous pressure and cardiac dilatation. In three of the patients there was no obvious clinical symptom suggesting heart failure except the presence of peripheral oedema, but more careful study of these three disclosed some dilatation of the heart and elevation of the venous blood pressure. It was found that the first objective evidence of improving cardiac function was a fall in the arterial blood pressure; slightly later the venous pressure returned to normal and the oedema disappeared. The circulation time was normal in practically every case. La Due was not able to make extended studies on the protein content of the tissue fluid, but this subject is rather controversial, as is also the part played by variations in osmotic pressure and in retention of salt in these cases. Complete integration of the problem of nephritic oedema is not yet easy. But without entering the realms of biochemical discussion, this article draws attention once more to the importance of observing accurately the clinical facts concerning the circulation in patients with acute nephritis. It is, of course, very important to focus attention on the renal function in these cases, but probably even more important to watch carefully those phenomena which indicate circulatory failure. In fact without minimizing the importance of the peripheral circulatory changes, it is essential to watch the heart itself, lest in the early stages of disease severe and even irreversible damage be done.

#### ACUTE MYOCARDIAL INFARCTION.

It might be thought that the changes occurring in the heart following occlusion of a coronary vessel are now so well recognized that there is little more to be said about them from the clinical point of view. However, the publication of some of the experiences of Herrick, to whom the honour of the recognition of the clinical syndrome belongs, has perhaps diverted interest once more into clinical channels. For some time past most of the studies have been on the purely technical side, so that it is interesting to read an analysis by S. Baer and H. Frankel on a series of 378 cases of acute myocardial infarction.<sup>2</sup> The cases studied were those seen in a large general hospital, and the aim of the study was to determine what progress had been made during the last decade in diagnosis and treatment. Of 508 cases spread over twelve years, critical review excluded 130 because the evidence was not convincing, but in the remaining 378 cases the diagnosis was confirmed. The ages of the patients ranged from twenty-seven to eighty-nine years, and it is interesting that in the last few years an increasing number of cases have been seen in younger persons. In the series the proportion of males to females was three to one, but the vascular accident occurred earlier in men, the average age being 56.7 years, whereas the average age for women was 61.6.

In another communication in the same journal Baer and Frankel present studies on the white blood cell counts, the sedimentation rate, the blood sugar content and the electrocardiogram. One of the important findings in this work was that leucocyte counts above 10,000 per cubic millimetre were found in 74% of cases, but the authors consider that if seen at the optimum time 90% of the patients should exhibit leucocytosis. It was also found that the electrocardiogram was diagnostic of acute infarction

<sup>1</sup> *Annals of Internal Medicine*, March, 1944.

<sup>2</sup> *Annals of Internal Medicine*, January, 1944.

in 94% of 321 cases. Returning to the purely clinical findings, we learn that pain was recorded in 90% of cases, dyspnoea in 76% and cyanosis in 46%. There was some degree of fever in 66% of cases, but it was noted that a pulse rate of over 100 per minute was present in only 47%. It should be well known by now that a rapid pulse rate is not the rule, but these figures emphasize this important point. A pericardial friction rub was heard in 12% of the cases. The authors quote Herrick, who listed 28 conditions which might simulate coronary occlusion, but it is probable that today a correct diagnosis is made much more frequently owing to the wider recognition of the symptoms. Still, in 20% of the cases described by Baer and Frankel the diagnosis made at the time of the patient's admission to hospital had no reference to any form of heart disease. However, this hospital review shows that the clinical diagnosis has steadily improved; and careful study of the patients and the case records has enabled these authors to confirm what is surely believed by physicians today, that is, that the clinical features of an acute myocardial infarction are as a rule sufficiently characteristic to point to a correct tentative diagnosis, at least in a great majority of cases, without laboratory assistance.

#### ATHEROMA IN YOUNG MEN.

THE training of large bodies of young men in warlike pursuits gives a remarkable opportunity for observing the incidence of arterial degeneration in early adult life and determining the cause of sudden cardiac failure or sudden death in this type of disease. A. J. French and William Dock have recently recorded the results of a study of 80 fatal cases of coronary artery disease among soldiers aged twenty to thirty-six years.<sup>1</sup> The title of their paper is "Fatal Coronary Arteriosclerosis in Young Soldiers". They discuss "arteriosclerosis" without defining it. We believe that they mean "atheroma". The 80 cases were selected from a total of 100 from which pathological material had been sent to the Army Medical Museum of Cornell Medical College. In these 80 cases death "seemed due to uncomplicated coronary lesions". French and Dock discuss the cases under the following headings: "Predisposing Factors", "Age Distribution", "Prodromes", "Factors Precipitating the Final Episode", "Mode of Death", and "Pathologic Anatomy".

They found no evidence of racial predisposition to arterial degeneration. Three of the men were of Negro and two of American Indian ancestry. "None had names usual among Jews of European stock, and few appear to have been of Jewish faith or ancestry." The majority of names were of English or Irish origin; but there were also Italian, French and Slav names. Among constitutional factors a tendency to obesity was noted. Seventy-three of the men were overweight; only two were thin; forty were obese, and of these eleven were noted as being "very obese". No attempt was made to assess the effect of tobacco. None of the men was noted to be a non-smoker; but this is not remarkable in view of the almost universal habit of smoking.

The age incidence was as follows: In the group aged 20 to 22 years, 5 cases; 23 to 25 years, 9 cases; 26 to 28 years, 11 cases; 29 to 31 years, 14 cases; 32 to 34 years, 21 cases; 35 to 36 years, 20 cases. It should be noted that the groups were all of three-year periods excepting the last one. It is safe to say that if men aged up to thirty-seven years were included, the number of deaths would have been considerably higher than in any of the earlier groups. French and Dock point out further that "the number of soldiers in each group probably falls off after the age of 25"; the actual rate of death due to coronary artery disease therefore rises much more rapidly with age than is indicated by the figures. "Fatal coronary disease obviously is far more frequent at 36 than at 20." The incidence of coronary artery disease at various ages is another matter and one

that will not be easy to determine. In 39 of the 80 cases areas of fibrosis were noted in the heart; but in only six of these cases had the soldier complained of symptoms that might have been related to the heart, prior to the fatal seizure. Therefore "it is probable that the actual incidence of coronary disease in the age group under analysis is much more frequent than is suggested by clinically unrecognizable and fatal cases".

Over one-third of the 80 soldiers made some complaint of symptoms that might have been related to the heart. Fifteen mentioned to their associates a few days or weeks before death that they had pain in the chest. Possibly there were others who did not complain at all or whose remarks were not specially noted. Ten soldiers reported sick because of pain in the chest. Two of them had pain related to food and relieved by belching. For the most part the pain was trivial. Careful examination of several of the men revealed no evidence of coronary arterial disease. One soldier reported dyspnoea. Three others complained of palpitation, which was due to "auricular tachycardia" in one case and "ectopic beats persisting into exercise in another", and for which no cause was found in the third. These three men continued at full duty for many weeks without further complaint. Unfortunately, no mention is made of the ages of the men who had symptoms.

Thirty-nine of the men lost consciousness suddenly and died without complaint. Seven died during sleep, and one woke up with pain and died soon afterwards. Twenty-four had a painful seizure, some dying shortly after, others living several hours or days. One man died of congestive cardiac failure six weeks after the onset of dyspnoea. One man suffered from precordial pain for one day and remained in bed without symptoms until sudden death without apparent cause in the eighth week. One man was stricken with hemiplegia while on parade. He died four days later. Autopsy revealed a large healed infarct. A remarkable feature of this case is that the man had been doing full duty without apparently being aware of any disturbance of cardiac function.

It is of interest to note that thirteen men suffered their paroxysm in the first two hours after rising and before drill. "The sudden change from complete rest to the effort of dressing and starting a new day may possibly be a special hazard." In this regard it might be mentioned that most physicians of experience have known patients who suffer from precordial pain while walking to the train or tram on their way to work, but remain free of pain for the remainder of the day.

The weight of the heart was recorded in 57 cases. It was found to be somewhat greater than the average of a group of controls; but it is suggested that this was due to excessive fat. No significant hypertrophy was noted. Recent cardiac infarction was noted in 15 cases and "fibrous scars" of the heart were noted in 39. The arterial lesions consisted of hypertrophy of the intima in every case and plaques of degenerated material in 75 cases. Calcification was noted in 30 cases. Atrophy or fibrosis of the media was noted deep to atheromatous plaques where these were of long standing. "Lymphocytic infiltration and fibrous thickening of the adventitia and of other layers were seen most often in older men." Thrombosis was observed in 29 cases. Disease of arterioles in other viscera, thrombo-angitis and periarteritis were absent. Perhaps the most interesting finding is the relation of effort to the fatal seizure. French and Dock calculate that the incidence of the fatal seizure was one per hour during sleep, seven per hour during the first two hours after awakening, ten per hour during vigorous effort, and three per hour during the rest of the day's activity.

It is apparent from this report that our knowledge of atheroma and its complications is far from complete. French and Dock might have studied the previous history and carried out a series of Wassermann tests in their cases with a view to correlating aetiology with pathological findings and mode of death. As it is, they have made a valuable contribution to the study of vascular disease. The occurrence of atheroma in young people is not sufficiently widely recognized.

<sup>1</sup> The Journal of the American Medical Association, April 29, 1944.



## Abstracts from Medical Literature.

### SURGERY.

#### Refrigeration in Amputations and Peripheral Vascular Disease.

E. E. O'NEIL (*The New England Journal of Medicine*, February 24, 1944) gives details of an attempt, made over the past three and a half years, to evaluate the role of reduced temperatures in the treatment of various peripheral vascular diseases. The use of cold as a therapeutic agent is not new, ice-packs having been used since the dawn of medicine. It has been determined that when the limb of an animal has been deprived of its blood supply by the application of a tourniquet, exposure to room temperature or to an increased temperature leads to a rapidly progressive gangrene of the part. Furthermore, if the ischemic limb is exposed to a reduced temperature, the onset of gangrene is very much delayed, and, in addition, the phenomena of shock, thrombosis, infection and injury to blood vessels and nerves are much diminished. The application of the requisite degree of cold also acts as an anesthetic agent on the limb. These facts have suggested the use of cold as an agent in human cases. The authors first discuss refrigeration as an anesthetic agent for amputation of limbs. A type of patient is frequently found in municipal institutions, admitted with rapidly spreading gangrene and vascular disease, ill-nourished and a "poor risk". In the treatment of such patients, general or spinal anaesthesia often contributes to a fatal termination, and in such cases, the author has utilized refrigeration anaesthesia with a great reduction in mortality. The area for application of a tourniquet is first chilled by application of ice-bags for a few minutes. A rubber tubing tourniquet is then applied as tightly as possible. The whole limb from the level of the tourniquet distally is refrigerated by being packed in ice. The limb must not be frozen, but a skin temperature of 8° to 10° C. as measured by holding an ordinary thermometer against the skin is maintained. In the average case, it takes about two to two and a half hours to produce sufficient anaesthesia for a painless amputation. The tourniquet is left on the whole time, and this prolonged application of the tourniquet has no ill effect on subsequent healing. In some of the author's cases, the tourniquet was left on for ten to twelve hours without any interference with primary wound healing. It may, in fact, be an advantage to wait, as refrigeration produces a marked improvement in the comfort of the patient, and also in his physical state. The amputation is performed without pain and without shock. The wounds are closed without drainage except when sepsis is present or feared. The stump is at first packed round with ice-bags which are gradually removed and the stump is allowed to return to room temperature. If, however, the skin edges show any evidence of sloughing, the cold applications are renewed in order to reduce the metabolism of the part to a level with which the available blood supply can cope. The author has also used the refrigeration method, without the tourniquet, in the treatment of a small

series of patients suffering from peripheral circulatory insufficiency with the object of lowering the metabolism of the part and averting threatened gangrene, inhibiting sepsis or retarding thrombosis. In some of the cases the results were very gratifying, but the series is too small for any conclusions to be drawn. When gangrene has already occurred, no amount of cold application will avert the necessity for amputation.

#### Spinal Anaesthesia in the Treatment of Megacolon.

MARGARET HAWKLEY (*The British Journal of Surgery*, January, 1944) describes experiences with spinal anaesthesia used (without operation) in the treatment of megacolon (Hirschsprung's disease). Twelve children, aged from two to eleven years, were treated. Two cases are too recent for evaluation. Of the first ten patients, six are classified as cured, the condition of three is improving, and one is no better. In the last case sympathectomy had already been carried out elsewhere. All patients had previously had prolonged medical treatment without success. It was found that, generally, neither an immediate evacuation on the table nor a rapid improvement afterwards could be expected, but that a long-term view should be taken. In the majority of cases it was found necessary to administer the spinal anaesthetic solution on two or even three occasions to obtain relief. Under the anaesthetic a rectal examination should be made and any faeces present removed manually. The pelvi-rectal sphincter should be felt; if the sphincter is contracted it is most important that it should be dilated. The author prefers light "Nupercaine" as the anaesthetic agent, and insists that paralysis of the anterior roots up to the sixth thoracic should be secured. Details of the technique employed are given.

#### The McNealy Caecostomy.

J. W. HOWSER (*The American Journal of Surgery*, September, 1943) reports his experiences with the McNealy caecostomy in eighteen patients seen over the previous year suffering from large bowel intestinal obstruction. Caecostomy is not a satisfactory method of providing drainage to the colon, as the contents discharged are fluid, and the faecal stream is not completely diverted. But in certain cases of complete obstruction of the distal section of the large bowel which conservative methods have failed to relieve, it may be a life-saving procedure. The usual types of caecostomy by the purse-string method or Witzel's method are liable to result in contamination of the peritoneal cavity when the caecum is opened. In addition, with a greatly thinned caecal wall, the sutures are liable to perforate the mucosa and allow leakage with possibly fatal results. The author has therefore adopted the method described by McNealy in 1937. A muscle-splitting incision is made under local anaesthesia and a pouch of caecum is gently drawn through and retained on the surface by the application of one or two pairs of curved forceps along the anterior tenia. Between the caecum and the parietal peritoneum a strip of iodoform gauze is placed to stimulate adhesion formation. The rest of the wound is packed open with gauze and the forceps are "taped" onto the abdominal wall. No

sutures are used at all. The caecum is opened from six to twelve hours later. In large bowel obstruction this slight delay is usually of little moment. When the opening is made, a de Pezzer catheter is tied in with a purse-string suture. The forceps holding the caecum are not removed at this stage, but slough off themselves in about ten days' time. In the reported series of eighteen cases, this type of caecostomy was successfully used, and in no case did contamination of the peritoneal cavity occur.

#### Carcinoma of Prostate: Union of Pathological Fracture of Femur following Castration.

A. W. MIDDLETON (*The American Journal of Surgery*, April, 1944) records a pathological fracture of the femur due to a metastasis from a carcinoma of the prostate. The patient was seventy-six years of age, and was treated for fourteen weeks by immobilization of the limb, but without any evidence of union. Bilateral orchidectomy was then performed, but no attempt was made to remove the prostate either partly or *in toto*. Union of the fracture then occurred and was radiographically "solid" after eleven months. It was accompanied by a remission of urinary symptoms and a reduction in the size of the prostate. The patient was able to walk with a cane and gained weight. He died twenty months after orchidectomy, probably from a cerebral vascular accident.

#### Abdominal Wound Evisceration.

M. G. HENRY (*The American Journal of Surgery*, April, 1944) discusses the causes of "burst abdomen" after laparotomy, and favours the theory that an allergic response by the patient to the catgut used to suture the wound leads to the absorption of this material before wound healing can occur. The author presents twelve case reports of wound evisceration, and describes the results of experimental work performed to investigate the allergic response in one of them. This patient gave a marked urticarial type of reaction when a solution of chromicized catgut (of the type used to suture her wound) was injected intradermally. Ten control patients whose wounds had healed normally after the use of the same gut, showed no sensitivity. The fact that burst abdomens are usually resutured with non-absorbable suture material and then heal satisfactorily is adduced as evidence that there is no indication that wound healing is, *per se*, at fault. The author favours the routine suturing of wounds with non-reacting, non-absorbable material, such as silk.

#### Fat Embolism in War Surgery.

J. B. WILSON AND C. V. SALISBURY (*The British Journal of Surgery*, April, 1944) report eight cases of fat embolism, and give the results of post-mortem examinations of the six patients who succumbed. The study was based on 1,000 consecutive battle casualties. The post-mortem findings are discussed in detail, and the diagnosis is regarded as resting on the findings of pulmonary hemorrhages and the characteristic appearances in the brain. In the fresh preparation of lung tissue fat globules can be seen, and the diagnosis is finally confirmed by osmic acid staining of the lungs, brain, kidney and heart. The diagnosis of clinical fat embolism is

stated to be rather indefinite at present. Various of the tests which have been recommended are discussed, and the authors conclude that diagnosis must rest on a sound clinical suspicion backed up by certain laboratory examinations, none of which is conclusive. If, however, a patient who has had no symptoms other than those of his injury, suddenly develops during the first few days of his illness symptoms such as increased temperature, respiration and pulse rate, if he is covered with sweat, seems restless and is irrational, then the diagnosis of fat embolism is almost certain. The diagnosis becomes even more absolute if it is possible to rule out shock, hemorrhage, intracranial injury, septicaemia or wound infection, and pulmonary infection and embolism. The treatment of fat embolism is unsatisfactory and empirical. Prophylactic measures consist of early immobilization of fractures with a minimum of manipulation. In the established case the authors suggest venesection if the blood pressure allows it, followed by intravenous therapy, with either whole blood or glucose-saline solution. In view of the fact that insulin may aid the liver to remove fat from the blood, it was used and thought to be helpful. Sedatives may be needed and dyspnea and cyanosis should be relieved by oxygen administration. The authors raise the question of whether the fat globules, in addition to their mechanical embolic effect, may have some further action of a chemical nature.

#### Rupture of the Bowel by Non-Penetrating Injuries.

TRAUMATIC rupture of the bowel by non-penetrating forces is a not uncommon injury which usually has a fatal termination. N. F. Hicken and J. H. Carlquist (*The American Journal of Surgery*, May, 1944) discuss the causes, diagnosis and treatment of the condition and report five cases of their own. Counsellor and McCormack, in 1935, reported 1,313 such cases. The mortality of the group in which operation was not performed was 100%, and even with operative treatment it was 60%. This high mortality rate is due not to any difficulty in repairing the damage, but to the difficulty in arriving at a diagnosis at a sufficiently early stage. The cause of the lesion is usually a force which crushes the bowel against the bony structures of the abdominal wall. But in other instances indirect trauma is responsible, such as jumping from a height. In the case of bowel contained in a hernial sac, the trauma may be due to attempts at reduction or to such minor forces as coughing, sneezing, urination or defecation. In the early stages of the condition, the clinical picture is one of shock. When the patient rallies from this state, he usually complains of dull aching pain in the region of the trauma. Later, nausea, vomiting, rigidity and an elevated temperature indicate the onset of peritonitis. But the onset of these later signs may be delayed for twelve hours or as long as ten days. This is because some degree of paralytic ileus may occur, and it is not until the bowel becomes active again that intestinal contents are poured out. In other cases the injury may have caused a partial devitalization of the bowel wall from contusion or injury to the mesentery, leading to a progressive necrosis which

may not cause actual perforation for a considerable time. In such cases the passage of blood in the stools with a rising leucocyte count and other physical signs of a developing acute abdominal condition may indicate the impending perforation. X-ray examination may reveal air in the peritoneal cavity, but this is to be relied on only as a positive sign, as its absence is of no significance. However, repeated X-ray examinations may be helpful. The presence of fluid in the abdominal cavity may be detected by physical signs or by aspiration. In some instances rectal examination may reveal a doughy fluctuant mass in the retrovesical space. It is important to differentiate the condition from an internal hemorrhage, but in the case of those patients who do not die immediately from the hemorrhage, the evidence of blood loss will usually be sufficient to prevent any delay in treatment. Another condition which may cause confusion is one of traumatic peritonitis without rupture. The early picture in this condition is again one of shock, but it usually subsides with the treatment for shock. Careful watching is, however, very necessary. When rupture of the bowel is diagnosed or suspected the treatment is operative as soon as the condition of shock has been corrected. Perforations should be sutured transversely, and resections should be avoided whenever possible. Exteriorization of the damaged loop may be necessary when simple suture is not possible. Resection may become inevitable in such sites as the upper part of the jejunum where there is not sufficient length of mesentery to permit of exteriorization. Meticulous post-operative care is required. Fluid and electrolyte balance must be maintained. The Miller-Abbott tube may be useful for distension and vomiting. Oxygen administration, vitamin therapy and transfusions of blood or serum will have their place. Early diagnosis will prove to be the secret of success.

#### Regeneration of Semilunar Cartilages in Man.

I. S. SMILLIE (*The British Journal of Surgery*, April, 1944) describes his experiences with the regeneration of the semilunar cartilages after removal. He recalls the work of Bruce and Walmsley, who described the regeneration in rabbits of the semilunar cartilages, which was seen to begin as early as four days after operative removal. One of the author's patients was subjected to arthrotomy six weeks after the original operation, at which it was known that only the anterior half of the cartilage had been excised. After this short interval the anterior horn was found to be completely reconstituted. In general a regenerated meniscus closely resembles the normal structure, but offers the following contrasts. It is composed of fibrous tissue which is much whiter and has a more glistening surface than normal fibrocartilage. No cartilage cells are seen on histological examination. The concave edge is thin, wavy and transparent. The new meniscus is thinner and narrower than normal, and has a very dense attachment to the capsule. In cases in which the previous surgeon had removed only the anterior half or two-thirds of the meniscus, it was found that the excised portion had been replaced by an ingrowth of fibrous tissue with the same characteristics as

those noted in reconstitution of the complete meniscus. Some lesions encountered in regenerated menisci are discussed and illustrated. It is claimed that the rarity of injuries of such structures is explained by the differences from the normal as regards cross-section and attachment. In all five cases reported here of tears of regenerated menisci, lesions of other structures concerned with the stability of the knee joint were also demonstrated.

#### Liver Stones Associated with Cholelithiasis.

R. R. BEST (*Surgery, Gynecology and Obstetrics*, April, 1944) makes an attempt to determine the frequency with which stones occur in the intrahepatic portion of the biliary duct system, in association with stones in the gall-bladder. In an analysis of the statistics of various authors it appears that indications for incision and exploration of the common bile duct will be found in regard to 20% to 40% of patients whose abdomens are opened for cholelithiasis. These indications are: a history of jaundice, palpable stones in the common duct, a dilated or thickened common duct, small stones in the gall-bladder, or thickening of the head of the pancreas. It appears, further, that common duct stones will be found in one in every four or five patients who have stones in the gall-bladder. In spite of care, cases arise from time to time in which the symptoms recur and a second operation becomes necessary for removal of recurrent or residual stones in the common duct. The author has previously reported an instance in which the common duct of a thin patient had been opened and explored easily without any stones being found, but when a cholangiogram was made eight days later no less than eleven stones were present in the common duct. The only conclusion to be reached was that these stones had been lying in the intrahepatic portion of the biliary system. The reason for their being dislodged in such cases may be manipulation or irrigation of the duct, or changes which occur in intraduct pressure following operation. In an attempt to discover the frequency of occurrence of these liver stones in association with gall-bladder stones, as indicated by autopsy records, the author found difficulty owing to the fact that in most such examinations the liver is not sufficiently carefully examined to give any guide. Certain records were, however, available, such as those of Miyake, of Japan, in which special care had been taken in the liver examinations. The statistics available seemed to be fairly unanimous in indicating that liver stones occur in about 7% of all cases of cholelithiasis. In view of the appreciable incidence of these liver stones, and the possibility of their descent into the common bile duct in the post-cholecystectomy period, the author suggests that several days prior to biliary operations the biliary system should be flushed out in an attempt to bring down any liver stones into an accessible position. To do this a three-day régime is suggested with the use of bile salts, nitroglycerin, atropine, magnesium sulphate and cream. He also recommends that this three-day treatment should be used again about the eighth day after operation, and repeated about two weeks later.

## British Medical Association News.

### MEDICO-POLITICAL.

#### MEDICAL COORDINATION COMMITTEES: TRANSFER OF CONTROL.

In the account of the meeting of the Federal Council of the British Medical Association in Australia, published in the issue of July 15, 1944, reference was made to the transfer of control of the medical coordination committees from the Department of Defence to the Department of Health. Though a *résumé* of the discussion was given, a statement submitted to the meeting by the President, Sir Henry Newland, was inadvertently omitted. The statement was as follows:

#### National Security (Medical Coordination and Equipment) Regulations: Transfer of Administration.

Concern may have been felt by members of the British Medical Association when they read in the daily Press that to make this change on March 28, just prior to the departure of the Minister for Defence for England. The reason given for the decision was that the Minister for Defence had found it necessary to arrange for many of the powers conferred upon him under National Security Regulations to be exercised by other Ministers, and that similarly it had become necessary for the activities of the Secretariat of the Department of Defence to be confined to matters of defence policy, higher defence administration and War Cabinet and Advisory War Council business. The Minister for Defence felt that it would be more appropriate and satisfactory for the responsibility for the administration of Medical Coordination and Equipment Regulations to be transferred to the Minister for Health, who had for some time been acting for and on his behalf in regard to these regulations.

Sir Henry Newland states that the Central Medical Coordination Committee was advised that it had been decided to make this change on March 28, just prior to the departure of the Minister for Defence for England. The reason given for the decision was that the Minister for Defence had found it necessary to arrange for many of the powers conferred upon him under National Security Regulations to be exercised by other Ministers, and that similarly it had become necessary for the activities of the Secretariat of the Department of Defence to be confined to matters of defence policy, higher defence administration and War Cabinet and Advisory War Council business. The Minister for Defence felt that it would be more appropriate and satisfactory for the responsibility for the administration of Medical Coordination and Equipment Regulations to be transferred to the Minister for Health, who had for some time been acting for and on his behalf in regard to these regulations.

Upon receipt of this advice a special meeting of the Central Medical Coordination Committee was convened, and representations were made to the Minister for Defence for reconsideration of the decision.

In these representations it was pointed out that as a war-time measure, the medical profession had accepted without demur a form of conscription which had not been required of any other section of the community. All legally qualified medical practitioners up to the age of sixty years had been rendered liable to serve either in the Citizen Forces or the Emergency Civil Medical Practitioner Service irrespective of the age group to which they belonged. The regulations when made which provided for these services it was understood were to continue in force only for the duration of the war and six months after. They would then be repealed.

The representatives of the British Medical Association on the Central Committee were apprehensive that with the change of administration of these regulations to the Minister for Health the regimentation of the profession might not cease with the cessation of hostilities.

In replying to the Central Committee's representations, the Acting Minister for Defence stated that he was unable to vary the decision made by the Minister for Defence. An assurance, however, was given that the Medical Coordination Committees would continue to function as hitherto, and that there would be no change in the existing procedure for carrying on the business of the committees. The regulations, it was pointed out, would not be amended other than to provide for the change in the Minister administering them.

The Central Committee, having considered this reply to its representations and the assurances therein given, unanimously decided, that while regretting that the *status quo* had not been maintained, to offer its fullest cooperation and do everything in its power to carry on, as it had previously, the task entrusted to it of coordinating the medical services of the nation during the war. That assurance having been given by responsible authority and accepted by the representatives of the British Medical Association on the Central Committee (Sir Henry Newland and Dr. J. Newman Morris), Sir Henry feels that the profession should and will do everything in its power to see that it is loyally supported and maintained.

The Minister for Health and the Chairman of the Central Medical Coordination Committee (Major-General Burston), Sir Henry states, have given approval to the publication of this statement.

#### PAY-AS-YOU-EARN TAXATION.

The following correspondence between the Federal Council and the Department of Taxation regarding pay-as-you-earn taxation is published at the request of the General Secretary of the Federal Council.

[COPY.]

FEDERAL COUNCIL OF THE BRITISH MEDICAL ASSOCIATION IN AUSTRALIA.

135 Macquarie Street,  
Sydney,  
18th July, 1944.

The Commissioner of Taxation,  
14 Castlereagh Street,  
Sydney.

Dear Sir,

With the introduction of "pay-as-you-earn" taxation I have been approached by members of the profession seeking advice on certain aspects of it affecting *locum tenentes* and their principals.

The period for which a *locum tenens* may carry on the practice of his principal varies from part of a day to an indefinite length of time, but generally is in the region of two or three weeks. For periods under a week he is paid on a daily basis, and for periods over a week he receives a salary on a weekly basis with board and lodging free, generally at the doctor's home, but at times at a boarding establishment or hotel in the vicinity.

The following are some of the questions which have been raised:

1. Will the principal, irrespective of the length of time that a *locum tenens* is engaged, be required to purchase stamps for the *locum tenens*, in accordance with the "Stamps Scheme"?

2. What value is to be placed on the *locum tenens'* board and lodging for the purpose of the "Stamps Scheme", and will this vary according to whether the *locum tenens* lives at the principal's home or elsewhere?

3. What amount is the principal entitled to claim, in the way of a tax deduction, for the expenditure involved in providing board and lodging for the *locum tenens*, when returning his income tax at the end of the year?

4. Should there be any circumstances under which the *locum tenens* is not called upon to pay under the "Stamps Scheme", what amount will he be required to show in his income tax return for board and lodgings?

It would be greatly appreciated if your advice could be given on the points raised, as I desire to pass it on to members of the profession.

Faithfully yours,

(Sgd.) J. G. HUNTER,  
General Secretary.

[COPY.]

DEPARTMENT OF TAXATION, N.S.W.

Savings Bank Building,  
14 Castlereagh Street,  
Sydney,  
1st August, 1944.

The General Secretary,  
Federal Council of the British Medical Association in Australia,  
135 Macquarie Street,  
Sydney.

Dear Sir,

With reference to questions numbered (1), (2), (3) and (4) in your letter of 18th ultimo, you are advised as follows:

1. Yes.

2. £1 per week. However, if it is agreed that the value of such board and lodging is in excess of £1 per week, it would be advisable to use the higher value when calculating the tax to be deducted.

3. The actual cost to the principal.

4. The estimated value to the *locum tenens*.

Although the principal can only claim the actual cost of providing board and lodging for the *locum tenens*, the latter must show in his returns the estimated value to him of the board and lodging provided. It is considered that the value of board and lodging provided in these circumstances would be in excess of £1 per week, and for this reason it is desirable



that when calculating tax instalment deductions the estimated value should be adopted instead of the arbitrary value of £1 per week. If this course is not followed the tax deducted during the year will not be sufficient to pay the tax that will be assessed on the return lodged by the *locum tenens*.

Yours faithfully,

J. W. HUGHES,  
Federal Deputy Commissioner of  
Taxation, per O. . . (Sgd.).

## Post-Graduate Work.

### COURSE IN MEDICINE AT SYDNEY.

THE New South Wales Post-Graduate Committee in Medicine has arranged a practical course in medicine which will be held from August 31 to September 13, 1944. Attendance is strictly limited to twenty, and preference will be given to candidates for the September, 1944, examination for membership of the Royal Australasian College of Physicians.

The course has been divided into two parts, the programmes for which are set out below. Half the number of those taking the course will attend Part I during the first week, while the other half will attend Part II. Those who attend Part I during the first week attend Part II during the second week and vice versa.

The fee is five guineas, and applications to attend the course should be forwarded with the amount of the fee to the Secretary of the committee at 145, Macquarie Street, Sydney. Telephone B 4606.

#### PART I.

##### Thursdays, August 31 and September 7.

- 10 a.m.—Pulmonary clinic, Sydney Hospital: Dr. E. H. Stokes.
- 2.30 p.m.—Radiological demonstration, Sydney Hospital: Dr. J. G. Edwards.
- 4 p.m.—Demonstration of selected cases, Sydney Hospital: Dr. H. Ritchie.

##### Fridays, September 1 and September 8.

- 10 a.m.—Ward rounds, the Prince Henry Hospital: The Post-Graduate Director of Medicine, Dr. S. A. Smith.
- 2.30 p.m.—Pathology, Department of Pathology, the New Medical School, the University: The Post-Graduate Director of Pathology, Dr. F. B. Byrom.

##### Saturdays, September 2 and September 9.

- 10 a.m.—Pathology, Department of Pathology, the New Medical School, the University: The Post-Graduate Director of Pathology, Dr. F. B. Byrom.

##### Mondays, September 4 and September 11.

- 10 a.m.—Ward rounds, the Prince Henry Hospital: The Post-Graduate Director of Medicine, Dr. S. A. Smith.
- 2.30 p.m.—Pathology, Department of Pathology, the New Medical School, the University: The Post-Graduate Director of Pathology, Dr. F. B. Byrom.

##### Tuesdays, September 5 and September 12.

- 10 a.m.—Pathology, the Department of Pathology, the New Medical School, the University: The Post-Graduate Director of Pathology, Dr. F. B. Byrom.
- 2.30 p.m.—Ward rounds, the Royal Alexandra Hospital for Children: Dr. L. H. Hughes.

##### Wednesdays, September 6 and September 13.

- 10 a.m.—Pathology, the Department of Pathology, the New Medical School: The Post-Graduate Director of Pathology, Dr. F. B. Byrom.
- 2 p.m.—Medical ophthalmoscopy, Sydney Hospital: Dr. A. T. Dunlop and staff.

#### PART II.

##### At Royal Prince Alfred Hospital.

##### Thursdays, August 31 and September 7.

- 9 a.m. to 10 a.m.—Laboratory procedures: Dr. E. M. Day, Dr. Jean Armytage.
- 10 a.m. to 12 noon.—Five cases will be allotted to the students for examination. These cases will be discussed by the senior honorary physician in the afternoon rounds.
- 2 p.m. to 3 p.m.—Neurological cases: Dr. E. L. Susman.
- 3 p.m.—Rounds with Dr. A. J. Collins.

##### Fridays, September 1 and September 8.

- 9 a.m. to 11 a.m.—Electrocardiography: Dr. J. H. Halliday, Dr. J. K. Maddox, Dr. R. F. Back.
- 11 a.m. to 12 noon.—Five cases will be allotted to the students for examination. These cases will be discussed by the senior honorary physician in the afternoon rounds.
- 2 p.m. to 3 p.m.—Allergy clinic: Dr. R. S. Steel.
- 3 p.m.—Rounds with Dr. T. M. Greenaway.

##### Saturdays, September 2 and September 9.

- 9 a.m. to 11 a.m.—Radiology of bones: Dr. H. R. Sear.
- 11 a.m.—Diabetic clinic: Dr. J. K. Maddox.

##### Mondays, September 4 and September 11.

- 10 a.m. to 12 noon.—Five cases will be allotted to the students for examination. These cases will be discussed by the senior honorary physician in the afternoon rounds.
- 3 p.m.—Rounds with Dr. A. S. Walker.

##### Tuesdays, September 5 and September 12.

- 9 a.m. to 10 a.m.—Chest clinic: Dr. H. M. Rennie.
- 10 a.m. to 12 noon.—Five cases will be allotted to the students for examination. These cases will be discussed by the senior honorary physician in the afternoon rounds.
- 3 p.m.—Rounds with Dr. C. G. McDonald.

##### Wednesdays, September 6 and September 13.

- 9 a.m. to 10 a.m.—Heart cases: Dr. J. H. Halliday.
- 10 a.m. to 12 noon.—Five cases will be allotted to the students for examination. These cases will be discussed by the senior honorary physician in the afternoon rounds.
- 3 p.m.—Rounds with Dr. L. H. Hughes.

## Obituary.

### ROY WILLIAM CHAMBERS.

WE are indebted to Air Vice-Marshal Victor Hurley for the following account of the career of the late Dr. Roy William Chambers.

The recent sudden and untimely death in Melbourne of Dr. Roy William Chambers, D.S.O., was deeply mourned by all who knew him.

Born in 1890, he was educated at the Brighton Grammar School and graduated at the Melbourne University in 1911. After filling resident appointments for the next two or three years at the Royal Melbourne Hospital, the Infectious Diseases Hospital and the Women's Hospital, he was one of the earliest medical officers to enlist in the first Australian Imperial Force in August, 1914. He was appointed to the Second Field Ambulance, which was under the command of the late Lieutenant-Colonel A. H. Sturdee, and took part in the landing at Anzac as a stretcher-bearer officer with that unit. He was promoted major in 1916, lieutenant-colonel in command of an ambulance unit in 1917, and for several months acted as Assistant Director of Medical Services of one of the Australian Imperial Force divisions. He was twice mentioned in dispatches for his meritorious work in the field and was awarded the Distinguished Service Order.

Few medical officers in the first Australian Imperial Force earned so high a reputation for courage and devotion to duty. His quiet unruffled efficiency in times of difficulty and danger always inspired confidence in all ranks. His men were devoted to him, and his fairness and consideration for their welfare gained their respect and trust. He fully shared their hardships and dangers, and by his example obtained from them the same high standard of devotion to duty as he set for himself.

In October, 1918, he was nominated for the Melbourne University Exhibition in Gynaecology and Obstetrics at Trinity College, Dublin, and the Rotunda Hospital, and later obtained the D.G.O. In May, 1919, he was appointed extern maternity assistant at the Rotunda Hospital, and after completing his work in Dublin he returned to Australia. He commenced practice in the northern suburbs of Melbourne and built up a large practice, while still devoting much of his time to obstetrics and gynaecology. His quality was soon recognized, and he quickly established a wide reputation in his chosen specialty. He was appointed honorary gynaecologist to the Royal Melbourne Hospital in 1924 and became a Fellow of the Royal Australasian College of Surgeons on August 8, 1928.

His services were in great demand by doctors for their own wives and families as well as by his hospital and private patients. He did not spare himself in his work and found time, amongst his other activities, to take a keen interest in the welfare of nurses, being a member of the Council and later President of the Victorian College of Nursing.

His relaxations were fishing and golf, and he was always a keen player in the annual inter-hospital matches which have been interrupted by the war.

His loss is probably most keenly felt by his hospital patients, who had the same implicit trust in him as his men on active service. He performed innumerable acts of kindness and generosity to his poorer patients, and the members of his old unit also knew well that in him they had a true friend in time of trouble, and at our annual reunions his presence was always hailed with delight by all.

He leaves behind a record of devoted and kindly service in every activity with which he was associated, and will long be held in affection by all those who knew him. Our sympathy is extended to his widow and daughter, Helen.

DR. ARTHUR WILSON writes: By the death of Roy Chambers the community has lost a very great obstetrician and gynaecologist, and I have lost a life-long friend. For nearly forty years we worked and travelled along parallel paths and maintained a close and cordial friendship throughout.

We commenced our medical course in 1907 and finished together in 1911. In 1912 we were residents at the Melbourne Hospital. The other residents were Kellaway, Webster, Crookston, Roche, Goldstein, Tait, Denehy, Nicholas (killed in action, 1917), Fargie and McLaren, with Vic Hurley the medical superintendent and Ted Cordner and Tiny Tymms the registrars. What a happy band of comrades we were. We had the reputation of being a very boisterous group of residents, but even in those days Roy's quiet imperturbability was much in evidence—so much so that if any prank was played Roy was usually one of the first suspected as being the perpetrator.

In 1912 Roy and myself were residents at the Women's Hospital—the others being G. G. Anderson (died in France, 1918), Daly and Utber. Here we learned the rudiments of obstetrics and gynaecology from Rothwell Adam, Felix Meyer, M. U. O'Sullivan, George Horne, R. H. Fetherston, A. W. D. Robertson and many others. Here also Roy met a charming and efficient young lady, Miss Maud Baker, who was in charge of the operating theatre and whom he subsequently married in England in 1917 when she was a nursing sister attached to the first Australian Imperial Force.

Even at this early date Roy decided to make the practice of obstetrics and gynaecology his life work, and he stayed at the hospital much longer than the average resident.

Immediately on the outbreak of war, Roy volunteered and was gazetted in the Australian Imperial Force, with the rank of captain, in the Second Field Ambulance in August, 1914; and he served with that unit right through the Gallipoli campaign and also in France. I did not see much of Roy during 1915, but received many reports of him from men of all ranks passing through the unit to which I was attached—and all were loud in their praises of his absolute reliability and his fearlessness and courage under fire and in all manner of difficult circumstances. He was mentioned in despatches for his services, but all agreed that he deserved greater recognition. At the end of 1915 we were in close proximity again, as we were with neighbouring field ambulances east of the Canal.

Then over to France in 1916 with the same units, and we saw a great deal of each other—even arranging our leaves together. I remember on one occasion I disliked intensely Roy's quiet imperturbability. The First Field Ambulance was taking over from the Second, and Roy, then a major, was deputed to show me round the various aid posts. He apparently decided to show me everything, and marched me round and showed me many places which, to put it mildly, were very hot. I stood it as long as I could, but finally protested, and Roy chuckled in his quiet way and murmured that he was wondering when I was going to complain, so we both retired hastily to a safer place.

In the middle of 1917 the war took a much better turn for us both. It was decided to form a Sixth Division, and Roy and I found ourselves together on the Salisbury Plains. He was Lieutenant-Colonel in command of the Seventeenth Field Ambulance and I was his second in command.

Here again I had evidence of his amazing ability. He was given about 250 "C" class men and told to form an ambulance. It looked a hopeless proposition. In less than three months he had welded the men together and so inspired them that it became an ambulance as good as any with

which I had served. These were very happy days, as we were able to get accommodation for our wives in a delightful little village, Collingbourne Ducis, on the edge of the Plain.

However, the Australian Imperial Force suffered such heavy casualties in the Ypres salient at the end of 1917 that the embryo Sixth Division had to be disbanded and used as reinforcements. Never shall I forget the disappointment of the men when Roy lined us up on parade and informed us that the unit was to be broken up. They did not mind so much being used as reinforcements, but to be separated from the commanding officer who had trained them was too much for them.



Roy returned to France as commanding officer of the Eleventh Field Ambulance, and soon afterwards was awarded the Distinguished Service Order which he so richly deserved.

Towards the middle of 1918 he had the opportunity of being the first Melbourne University Exhibitioner in Gynaecology and Obstetrics at the Dublin University and the Rotunda Hospital. He had some misgivings at going, as the war was not over, but those of us with whom he discussed the matter were most anxious that he should accept, as he had served practically continuously for over four years in the field and had done nothing to further his career in his chosen specialty. He accepted the position and obtained the D.G.O. in 1919.

He returned to Australia early in 1920 and took over the general practice of George Howard in Carlton. Soon after, we were both appointed obstetric surgeons to the Women's Hospital and clinical assistants at the Melbourne Hospital to the gynaecologist, Dr. R. H. Fetherston—to whose kindly help and encouragement both of us owed so much.

On the retirement of Dr. Fetherston, Dr. R. H. Morrison was appointed and Roy became his assistant.

On the retirement of Dr. R. H. Morrison, Roy was rather in a quandary. He had long associations with the Melbourne Hospital, and even longer with the Women's. The holding of dual appointments—rightly or wrongly—was frowned upon in some quarters, and after much consideration Roy decided to resign from the Women's Hospital and accept the position at the Melbourne Hospital. He held this position until his death, and in it he established his outstanding reputation. His judgement was uncanny and his operative work was brilliant.

To me—who knew him so well and so intimately—he appeared to be the ideal specialist and consultant—or even more broadly to be the ideal practitioner of the art of medicine.

His quiet reserved demeanour, his unruffled calmness, his courtesy to all (patients, doctors and nurses), his kindness, his absolute honesty and integrity—yet withal his own quiet confidence in his own knowledge and ability—could not fail to impress and inspire all patients and doctors who sought his aid.

During the past few years, many of us had realized that he was far from well and we had many anxieties about him. To those of us who ventured any suggestions, he would always remark that if he stopped working whilst so many of his colleagues were away, it would throw a still heavier burden on those that were left and that he would carry on a bit longer.

I last saw him on Sunday, March 26, at the entrance of the Jessie McPherson Hospital. We had just finished our rounds there and he then told me that his gall-bladder trouble had become so acute that he had decided to go into hospital and be operated upon in about a fortnight. On the following day I learned that he had become acutely and desperately ill a few hours after I had seen him. He died on Tuesday, March 28, only forty-eight hours after the onset of his illness, which was so desperate that it excluded the possibility of any surgical intervention.

I cannot help but feel that, in the cause of humanity, he continued working long after the time when most of us would have stopped, and by so doing he sacrificed himself.

So, at the early age of fifty-four, Roy has left us, and we are all much the poorer for his passing.

DR. B. T. ZWAR writes: The Royal Melbourne Hospital has lost one of the most beloved members of its medical staff by the death of Dr. Roy William Chambers, which took place on March 28. He had been associated with the Royal Melbourne Hospital as a student, resident medical officer, teacher, and as gynecologist for over thirty years, and was regarded by all with the greatest affection and esteem. Others will pay a tribute to his outstanding work as a medical officer in the first Great War and to the eminent position in the particular field of surgery in which he rendered such conspicuous service. For me it is a great privilege to pay testimony to his ever-ready helpfulness in anything which affected the interest of the hospital to which he was devoted and which he served most loyally and with great distinction.

Although for years Roy Chambers had been the subject of very indifferent health, he was never known to complain, nor did he allow it to interfere with his duties. It was always a matter for admiration to see him—whilst enjoying well-earned and much-needed rest and holidays—answer professional calls with readiness and cheerfulness.

In the field of sport Roy Chambers always showed himself a generous opponent and a most unselfish partner. Apart from his great professional achievements, Roy Chambers will be remembered for his lovable, unselfish and modest character.

The new Royal Melbourne Hospital at Parkville contains an operating theatre which bears his name, specially donated and equipped by one of his grateful patients. By his death the profession has suffered a great loss, and all who knew him a most cherished and revered friend.

DR. ERIC GANDEVIA writes: I first became associated with Roy Chambers at the Royal Melbourne Hospital in 1937, and thus commenced a friendship which became firmer with the years.

The courage and devotion to duty which earned Roy Chambers such well-merited recognition in the Great War was never more clearly displayed than in his later years, when he continued his arduous work under the constant strain of ill health.

Despite this ever-present worry, I never heard him complain, even at the end of a tiring day.

By virtue of an innate orderliness of mind Roy managed to get through a seemingly impossible amount of work each day. Truly it may be said that Moynihan's dictum, "Speed should be an accomplishment and not an aim", found its embodiment in Roy Chambers—not only in operating (to which Moynihan referred), but in his daily routine.

Efficient himself, he expected efficiency in those working with him, and such was the loyalty and devotion he commanded that he was seldom disappointed. Slackness he would not tolerate—his rare rebukes were never forgotten and always respected.

To accompany Roy on a holiday brought the realization that his reserved rather shy manner partly concealed a wealth of quiet humour, a kindness and an understanding of others. He had a real interest in the people he met. It became easy to understand the implicit trust and confidence which his patients had in him.

Of late Roy's days of relaxation were all too few and usually spent on the golf links, where he was always "on call" if needed. A keen golfer, he was a member of the Royal Melbourne and Peninsula Golf Clubs. When able to go further afield, he liked nothing so much as fishing, either sea fishing or wading the fresh-water streams for trout.

A member of the Victorian Racing Club and the Moonee Valley Racing Club, Roy was a lover of horses and a keen judge of them.

As chairman of the Nursing Board he had the interests of the profession at heart. As one sister declared: "We have lost a friend." This simple statement expresses the sense of loss of the medical and nursing professions; in it also lies their whole-hearted sympathy to Mrs. Chambers and her daughter, Helen.

I know he will awake . . .  
And he will have some gentle word to say,  
Some kindly deed to do; for loving thought  
Was warp and woof of which his life was wrought.  
He is not dead. Such souls for ever live  
In boundless measure of the love they give.

["Mystery", by Jerome B. Bell.]

DR. D. M. EMBELTON writes: I wish to express the appreciation, esteem and affection for Roy Chambers which is felt by so many.

During a long association which began in 1914 as house surgeons together at the Women's Hospital, Melbourne, and ended thirty years later in his death, I came to know him intimately in peace and war as a soldier, a consultant and a friend. Wherever he was he was always the same—prompt, courageous, generous and true.

As a family physician, for many years I commended gynecological patients to his care and invoked his aid in difficult obstetrics. He never left a simmering problem that could be solved. The big way was his way if it seemed the best. The difficult surgery looked easy as he took it in his swift and steady stride. He produced results and gave me a faith which I passed on to my patients in assurance. At any hour of the day or night his spontaneous readiness to give advice or prompt help was inspiring. He was always simple and straightforward in his ways, kind in his judgments and generous in his thoughts. Life's vicissitudes left his loyalty to his friends unaltered and unwavering. The solicitous care of his wife and staff could not protect his health which suffered under the burden of a prodigious surgical practice, accentuated by his added zeal during wartime. His death—nevertheless quite unexpected—was a sad blow to numberless patients who had benefited by his skill, to others who had benefited by his kindness, and to his many friends and to his family most of all.

His death is a great loss to the medical profession, who relied upon him and looked up to his surgical and personal standards. Yet he has not gone from us—his influence will remain with us always.

JAMES MURRAY COOK.

We regret to announce the death of Dr. James Murray Cook, which occurred on July 26, 1944, at Rockhampton, Queensland.

## Correspondence.

### NEPHROTIC TYPE OF NEPHRITIS IN ASSOCIATION WITH QUARTAN MALARIA.

SIR: At page 90 of your issue of July 22, 1944, K. S. Harrison and W. P. H. Dakin provide an interesting report of a case of the nephrotic type of nephritis in association with quartan malaria at a south-west Pacific island. They mention that this type of nephritis has been reported from several localities where the disease is prevalent (they doubtless have in mind the publication on the subject by Gigglioli, of Guiana), but that it is their impression that no such cases have been recorded from the south-west Pacific area.

Actually extensive work on this subject was performed by Dr. Edward G. Sayers, of Auckland, New Zealand (who, for a number of years, was stationed at Kokeqolo, Roviana Lagoon, British Solomon Islands Protectorate), and recorded in various publications.

The incidence is widespread in New Georgia and other areas of the group, where also quartan malaria is rather commoner than in other areas of the Melanesian chain.



The work done on nephritis by Dr. Sayers was one factor in the presentation of a medal provided by the Commonwealth for work in respect of tropical diseases in Australia or the islands adjacent to it, of which Dr. Sayers was, in 1940, the last recipient. (Brisbane *Telegraph and Courier Mail*, March 8, 1940.)

Yours, etc.,

R. W. CILENTO.

Department of Health and Home Affairs,  
Brisbane,  
August 16, 1944.

### Nominations and Elections.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Cumming, Geoffrey G., M.B., B.S., 1943 (Univ. Sydney), 7, Moore Street, Liverpool.  
Broadfoot, James, M.B., B.S., 1943 (Univ. Sydney), 1, Chelmsford Avenue, Lindfield.  
Basil-Jones, Margaret Walker, M.B., B.S., 1939 (Univ. Sydney), 4, "Stradbroke", Gladswood Gardens, Double Bay.  
Gordon, Alwyce Betty, M.B., B.S., 1944 (Univ. Sydney), Royal North Shore Hospital, Crow's Nest.  
Callagher, John Paul, M.B., B.S., 1942 (Univ. Sydney), 52, Minna Street, Burwood.  
Couani, John, M.B., B.S., 1943 (Univ. Sydney), Prince Henry Hospital, Little Bay.

The undermentioned has applied for election as a member of the Tasmanian Branch of the British Medical Association:

Walker, Morris Arthur, L.R.C.P., L.R.C.S., 1932 (Univ. Edinburgh), Snug, Tasmania.

### Medical Appointments.

Dr. Richard Bartley Lynch has been appointed Government Medical Officer at Glen Innes, New South Wales.

Under the provisions of *The Cremation Acts, 1913 to 1935*, Queensland, Dr. Eric James Reye and Dr. Leonard Allan Windsor-McLean have been authorized to sign permissions and certificates for cremation, and to grant permission to cremate any human body after death.

Dr. Lewis Wibmer Jeffries, Dr. Philip Santo Messent, Dr. Edward Angas Johnson, Dr. Arthur Murray Cudmore and Dr. Herbert Henry Ernest Russell have been appointed members of the Medical Board of South Australia.

Dr. Frank Burnet Byrom has been appointed Director of the Institute of Medical and Veterinary Science, Adelaide.

### Books Received.

"The Psychology of Women: A Psychoanalytic Interpretation", by Helene Deutsch, M.D., with a foreword by Stanley Cobb, M.D., Volume I; 1944. New York: Grune and Stratton. 8½" x 5½", pp. 411. Price: \$4.50.

"Caesarean Section: The History and Development of the Operation from Earliest Times", by J. H. Young, M.B., Ch.B., D.T.M. and H. (Edinburgh), with a foreword by Miles H. Phillips, M.D. (Hon.), B.S., F.R.C.S., F.R.C.O.G.; 1944. London: H. K. Lewis and Company, Limited. 8½" x 5½", pp. 261. Price: 16s. net.

"Virus Diseases in Man, Animal and Plant", by Gustav Seiffert; 1944. New York: Philosophical Library. 9" x 5½", pp. 340. Price \$5.00.

"A Guide to the Surgical Paper, with Questions and Answers", by R. J. McNeill Love, M.S. (London), F.R.C.S. (England); Second Edition; 1944. London: H. K. Lewis and Company, Limited. 6½" x 4", pp. 80. Price: 6s.

"War Wounds and Injuries", edited by R. Maingot, E. G. Slesinger and E. Fletcher; Second Edition; 1943. London: Edward Arnold and Company. 8½" x 5½", pp. 499, with many illustrations.

"The Management of Neurosyphilis", by Bernhard Dattner, M.D., Jur.D., with the collaboration of Evan W. Thomas, M.D., and Gertrude Wexler, M.D., with a foreword by Joseph Earle Moore, M.D.; 1944. New York: Grune and Stratton. 9" x 6", pp. 358. Price: \$5.50.

"The Theory and Technique of Child Guidance", by P. H. Cook, M.A., Ph.D.; 1944. Melbourne: Melbourne University Press. 8½" x 5½", pp. 136. Price: 8s. 6d.

### Diary for the Month.

AUG. 31.—New South Wales Branch, B.M.A.: Branch Meeting.  
SEPT. 1.—Queensland Branch, B.M.A.: Branch Meeting (Jackson Lecture).  
SEPT. 5.—New South Wales Branch, B.M.A.: Organization and Science Committee.  
SEPT. 6.—Western Australian Branch, B.M.A.: Council Meeting.  
SEPT. 6.—Victorian Branch, B.M.A.: Branch Meeting.  
SEPT. 7.—New South Wales Branch, B.M.A.: Special Groups Committee.  
SEPT. 7.—South Australian Branch, B.M.A.: Council Meeting.  
SEPT. 8.—Queensland Branch, B.M.A.: Council Meeting.  
SEPT. 8.—Victorian Branch, B.M.A.: Legislative Subcommittee.  
SEPT. 12.—New South Wales Branch, B.M.A.: Executive and Finance Committee.  
SEPT. 12.—Tasmanian Branch, B.M.A.: Branch Meeting.  
SEPT. 15.—Victorian Branch, B.M.A.: Ethics Subcommittee.  
SEPT. 15.—Victorian Branch, B.M.A.: Hospital Subcommittee.  
SEPT. 18.—Victorian Branch, B.M.A.: Finance Subcommittee.  
SEPT. 19.—New South Wales Branch, B.M.A.: Medical Politics Committee.  
SEPT. 19.—Victorian Branch, B.M.A.: Organization Subcommittee.  
SEPT. 20.—Western Australian Branch, B.M.A.: Branch Meeting.  
SEPT. 21.—South Australian Branch, B.M.A.: Council Meeting.  
SEPT. 21.—Victorian Branch, B.M.A.: Executive Meeting.  
SEPT. 21.—New South Wales Branch, B.M.A.: Clinical Meeting.  
SEPT. 22.—Queensland Branch, B.M.A.: Council Meeting.

### Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

**New South Wales Branch** (Honorary Secretary, 135, Macquarie Street, Sydney): Australian Natives' Association; Ashfield and District United Friendly Societies' Dispensary; Balmalm United Friendly Societies' Dispensary; Leichhardt and Petersham United Friendly Societies' Dispensary; Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney; North Sydney Friendly Societies' Dispensary Limited; People's Prudential Assurance Company Limited; Phoenix Mutual Provident Society.

**Victorian Branch** (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federated Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

**Queensland Branch** (Honorary Secretary, B.M.A. House, 325, Wickham Terrace, Brisbane, B.17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

**South Australian Branch** (Honorary Secretary, 178, North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

**Western Australian Branch** (Honorary Secretary, 205, Saint George's Terrace, Perth): Wiluna Hospital; all Contract Practice appointments in Western Australia.

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